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The Value of Greek Art.

IN the preface to his Seventh Book, Vitruvius declares that he sought for the principles of his art amongst the Greeks, not the Romans. What little of the theory of Greek construction it was possible to acquire from the Latin author had long been studied by European architects when the archæology of "that Athens which invented all the arts" was made scientifically known to them by natives of this country. A little more than a hundred years ago exact drawings of certain masterpieces of Athenian architecture were presented to the public by James Stuart and Nicholas Revett. The two travellers,—in those days they were worthy to be called travellers,—arrived in Athens on the 17th of March, 1751; and during a residence there of more than two years and a half they measured and drew every original building which they found remaining, and of which the remnants extant seemed to them sufficiently important and interesting. Quitting Athens at the end of 1753, they crossed to Salonica, and afterwards to Smyrna, whence they returned to England at the beginning of 1755, having been absent nearly five years. It was only, however, in 1762 that the first volume of their celebrated work, "The Antiquities of Athens," appeared; and it was only in 1790,—twenty-eight years after the appearance of the first volume, and two years after the death of its principal author,—that the second volume was published. This was edited by William Newton, whose own death occurred before the publication of the third volume in 1794. The fourth and concluding volume did not see the light until 1816, fifty-four years after the first volume and more than sixty years after the return of Stuart and Revett to England. A French translation of the work, with a reproduction of their drawings, was published in Paris between the years 1808 and 1822. In 1832 the late M. Hittorf dedicated a careful reproduction in one complete volume of the "Unedited Antiquities of Attica,"—the work of the London Dilettanti Society,—to Charles Percier, adding notes of his own from personal experience in Greece. In these translations the French did loyal justice to the enterprise and ability of the English archæologists. In the matter of Roman and Græco-Roman antiquities, the former had long been masters of the situation; but, until the time of Stuart and Revett, purely Greek art was not thoroughly understood nor appreciated by them. In the reign of Louis XIV. the "Recueil des Antiquités de Rome" was brought out by Desgodetz, who had been sent into Italy by the Minister Colbert to measure and draw the early Roman buildings. This book was the first of the kind in which exact details, drawn to scale, were offered to the public; and, doubtless, the success which attended it led Stuart, who was conversant with Continental affairs, and was an art-student at Rome, to attempt the task he successfully, although tardily, accomplished. It is, however, much to be lamented that the only volume the publication of which he personally superintended should have been loaded with attacks and recriminations aimed at a French traveller who began his journey to Greece *viâ* Venice and Constantinople six months after Stuart had left Athens. This gentleman, by name Le Roi, professed to give details in a book called "Ruines de la Grèce," written, after a two months' visit, as accurate as those over which Stuart and Revett had spent two years. Hence bitter and unseemly criticisms of the quick and superficial Frenchman as unworthy of the English scholar as they were unnecessary to support the general accuracy of his memoranda. The researches of none of the three travellers could, however, have influenced the architect Gabriel, to whom the credit of having imparted a Greek *cachet* to the Classical buildings of his time is undoubtedly due. If the admirable façades on either side of the Rue-Royale, in Paris, seem to be more like the production of a Greek working for a Roman master than any of the numerous "monuments" erected by the two Mansards and their many colleagues, it is probably due to the labours of Desgodetz, and the data furnished by him. Gabriel's project for the Place Louis XV. (now the Place de la Concorde) was approved and signed by the king at Compiegne on the 20th of July, 1753, a month or so before Stuart quitted Athens; and immediately afterwards the Marquis de Marigny sent copies of the plans to the municipal authorities, who commissioned Gabriel to begin the celebrated Place, in the neighbourhood of which at the present day two avenues—Gabriel and Marigny—bear historical witness of these facts.

The original coloured drawings of Athens made by Stuart are in the library of the Royal Institute of British Architects, and attached to them is the letter written by his daughter, acknowledging a draft from the purchaser of "my father's drawings." They were presented by the executors of the late Thomas Howard, in November, 1873. An original edition of the "Antiquities of Athens" is also in the library, together with the supplementary volume, "delineated and illustrated" by the late Mr. Cockerell, Professor Donaldson, and others. We shall have done a pleasant duty if by this short reference we succeed in calling the attention of students, at least, to these valuable works, and thereby rescuing them from the oblivion to which they have been too long condemned. It may interest the curious to know that in the same library there is a memorandum-book of Stuart's containing notes and rough sketches of Italian subjects; and there are also some of his pen-and-ink sketches and MSS. referring to Greece collected in an album presented by the late Joseph Woods in 1863.

According to Spon and Wheler, who visited Athens in February and March, 1676, the Parthenon was then entire. It is certain that on the site of the present Parthenon there stood an earlier temple, and on the site of the Propylæa an earlier entrance gateway, both of which were destroyed B.C. 480–479. The present ruined buildings on the Acropolis were commenced under the superintendence of Phidias, B.C. 448, and it is said that the Parthenon remained sacred to the Virgin, Athene, down almost to the sixth century of the Christian era. It was then dedicated to another Virgin, and during the first years of the thirteenth century became the metropolitan church of Athens. In 1459 it was converted into a Turkish mosque, and during the siege by the Venetians in 1687 into a powder magazine, when the explosion occurred which precipitated its subsequent ruin. The Parthenon is said to have been completed in ten years, B.C. 448 — 438. The Propylæa were erected between the years B.C. 437—432; and these were regarded by the ancients, and Gothic scholars confirm the Classical opinion, as superior to the Parthenon itself. The Erechtheum, according to Bædeker's Handbook—and in the perplexity which any mention of this extraordinary puzzle usually occasions he may as well be cited as more orthodox historians,—"comprised within its ample precincts the most ancient and venerable shrines of Athens. Here Pallas Athene, the tutelary goddess of Athens, and her first priestess, Pandrosos, were revered; here were the tombs of the mythical kings, Erechtheus and Cecrops; here the sacred olive-tree planted by Athene, and the salt spring caused to flow by Poseidon, during the contest of these two deities for the possession of the country." Nearly all the remains of temples which are to be found in Athens, appear to have been built in the forty or fifty years which succeeded the Persian War. In the words of Mr. Fergusson,—"The whole of the great history of Greece may be said to lie between the battle of Marathon, B.C. 490, and the peace concluded with Philip of Macedon by the Athenians, B.C. 346. All those wonders of patriotism, poetry, and art for which Greece was famous, crowded into the short space of a century and a half, is a phenomenon, the like of which the world has not seen before, and is not likely to witness again."

The modern traveller has little inducement to visit Athens other than to gaze at the mutilated fragments of a very few monuments. So many books, drawings, and photographs, so many actual copies in stone and plaster in so many countries, are now within the reach of every student, that were it not for the Athenian Propylæa, which must be seen to be be understood, it is almost a pity to destroy by a visit more than one cherished illusion regarding

all antiquity divested in its ruins of even the still life which originally adorned it. In the museums of Europe lie half-hidden the ravished splendours of Athens. To the name of Lord Elgin belongs an unenviable notoriety. Ambassador from England to Turkey between the years 1801 and 1812 he carried away with him, amongst other things, to this country one of the columns and one of the caryatides of the Erechtheum; several of the metopæ, a large portion of the frieze, and the best statues of the tympana from the Parthenon; and the whole were transferred to the British Museum, and became the property of the nation by an Act of Parliament dated the 1st of July, 1816, at a cost of 35,000*l*.

Our excuse for the foregoing recapitulation of certain dry facts connected with Greek architecture is that, at the Conference of Architects to be held this ensuing week in London, one evening is to be devoted to a discussion on the subject. It is to be introduced by Mr. Burges in a paper on "The Importance of the Study of Greek Art and Literature to the Practice of Gothic Architecture," and he will be assisted by Mr. Pullan in another paper on "Greek Art illustrated by its Monuments." Perhaps no better moment than the present could have been chosen to reconsider the principles of Greek design and construction—to look at both with Gothic eyes and with Gothic arguments at the fingers' ends. The labours of Stuart and Revett have been productive of consequences in France, more extended and probably more enduring than the wide and congenial researches of Pugin and M. Viollet-le-Duc have effected upon recent architectural movements in this country. On the other side of the Channel the existence of a Neo-Greek school is an absolute fact patent to all who are able to penetrate its little subtleties, and comprehend the perhaps slight reasoning which dictates the use of materials, and the forms given to them. It is not too much to say that there is no *culte* or school of the kind in England, or even in Scotland; and that those copies of Greek buildings which have been erected in this island are too like their original models, or too Roman in their treatment, to deserve the title of Neo-Greek. The seed sown by "Athenian Stuart" fell in France upon soil prepared to receive it; but the majority of British architects still cling to the dictum of Sir William Chambers,—foolishly published in 1791,—that "the study of Greek monuments does not offer sufficient instruction." We are persuaded, however, that a parallel of Greek and Gothic principles, as deduced from an examination of the best Greek and Gothic works extant, would form a valuable contribution to archæological science, and be at the same time a practical aid to both masters and students. There is no reason why English architects should not one day do as well in their line as the Greek did in his. Artistic progress and success are said to be a question of race; and had there been no Pelasgi in Greece, there would have been no architecture as perfect as that of the great Grecian era. According to Mr. Fergusson, it was only as late as the seventh century before Christ that the old Turanian form of Pelasgic art gave place to creations of Hellenic design. The artistic "dark ages" of Greece lasted four centuries, during which the Aryan power of self-government and capacity for republican institutions developed with the laws of Lycurgus. In the composite Anglo-Saxon race, bred to a similar mode of thought and discipline, may surely be found something of each of the four great building races of mankind. Human nature, the force of reason, common sense, are much the same in living Englishmen as in the subjects of Pericles. "It must not be readily conceded," said Professor Barry in a recent lecture, "that man cannot do now what he once did; for to grant this would be to deprive us of all heart in our work"; and in another paragraph he continued very happily, "the rich and powerful pressed architecture into their service. For their purposes grandeur was everything. . . . . The poor might live in hovels, but there must be splendid palaces and stately temples. . . . . Great opportunities may hereafter occasionally arise for the architect, but for the most part he must prepare himself to take advantage of more numerous opportunities of smaller things." Although it may be vain, as Mr. Forsyth says in his "Life of Cicero," to look for the sentiment of Gothic architecture amongst Classic ruins, it is certain that in Gothic ruins there may be found every Classic principle of construction. We rejoice that in a recent article upon the works of M. Duc, the gold medallist of the year, we unconsciously gave a hint of the subject which is to be discussed next Wednesday evening. We said, the day has happily gone by when any professor dare intimate that the study of one form of pure art can militate against practice in another, and Englishmen who have designed the most successful adaptations of native architecture have owned, perhaps a little late, that from the Athenian Propylæa they first acquired a thorough appreciation of the principle and beauty of Mediæval construction. That a scientific reconsideration of classical details, and the antique mode of combining them, will not again lead, in England, to the erection of churches and other public buildings in the guise of Greek temples is certain now that all classes of the people have ceased to even wish to wrap their dwellings in the trappings of a Mediæval church. Satiated with every description of burlesque, modern communities cannot fail to see the bathos which underlies every, even the best, effort of restoration or reproduction,—that "alacrity of sinking" which Swift took as the text of a satirical sermon. Doric, Ionic, and Corinthian masterpieces succumb to the irony of circumstances when imported to these Western shores; and always in England, and often in France, even good copying from the antique may be taken as truly described in the line of Byron, itself an imitation:—

"You plan a vase, it dwindles to a pot."

Amidst the confusion of successive fashions in modern architectural art and a continual craving for originality, it cannot be unprofitable to remember that Solomon's wise saying applies equally as much to Greece in her best days as to every race of builders in wood, stone, or marble. Nothing was new in the Athens of Pericles, except intellectual refinement. The origin of every architectural feature that has been found in Greece may be traced to the artistic forms of Egypt and Assyria. In a stone capital taken from the Southern Temple at Karnac, built sixteen hundred years before the Christian era, are to be seen all the members of that of the Doric order,—a thousand years before the Etruscans or any other ancient people dreamt of such a thing. Out of the mounds of buried Assyrian cities have been dug fragments of mouldings and sculpture the almost exact counterpart of those which archæologists term Grecian. Although the Doric capital may have been honestly reasoned out by logic-loving constructors on a block of stone, it is certain that it came from Egypt, where architectural form is essentially based upon the traditions of wood construction. It is certain also that the Ionic volute came from Asia, and indisputably from a wooden model. It is impossible not to believe that the stone construction of the Greeks, however intellectually perfect, was evolved from an earlier mode, not necessarily Greek, of imitating wood beams in blocks of stone; and it is equally difficult not to perceive in the inevitable evolution of constructive details that a wood origin must be attributed to many of the mouldings and the ornaments which cover them, and which, under any other hypothesis, would possess no meaning at all. A suspicion that the ubiquitous "egg-and-tongue" moulding arose from the appearance presented by the ends of reeds laid side by side and cut obliquely does not detract from its acknowledged elegance. The slanting underside of the "corona" in many of the Doric temples and propylæa is essentially wooden,—like the sloping rafters of earlier and possibly smaller contemporary buildings. Indeed, M. Viollet-le-Duc shows this very conclusively in his "Habitations of Man in all Ages" (see Plate 67); and in such a way as to lead the reader to suppose that had he not asserted the contrary in a previous work he would have boldly maintained the wooden origin of several Greek details. His words put into the mouth of Eicos, the Athenian architect, are:—"You see that the form given to the entablature of the Doric order can be adapted with some unimportant variations to a structure in stone as well as to one in wood; in neither case involving the necessity of falsifying the form or the structure. I will not dissemble the circumstance that some architects combine the two methods; . . . . that is, they do not hesitate to lay friezes and courses of stone upon architraves of wood; but this is reprehensible. . . . . I say again it is scarcely admissible that a wooden structure suggested the stone structure in the composition of the Doric order. . . . . Still, it must be acknowledged that our architects have skilfully adapted the form to the structure in both cases!" Indeed, the conviction that the divers members of a Greek entablature are inspired from remote wooden precedents should no more militate in the mind of a modern architect against a just appreciation of Greek building than the reputed descent of man should eradicate amongst the students of Mr. Darwin admiration for the human form.

The manner in which some of the Greek temples were lighted has given rise to hypotheses of a different and contradictory kind by the several archæologists who have deemed the subject worthy of consideration. Mr. Fergusson, from his long and extended Indian experience, must know perfectly well how very little light is required in countries where light means heat; and where the atmosphere is bright, how brilliant a ray can penetrate through a chink in the wall, a broken blind, or a torn curtain. Yet under the blue vault of Attica, and on the summit of the Acropolis, he has imagined the statue of Minerva illumined through something very like a modern skylight. We are not disposed, however, to venture upon any supposition, or even to take literally the assertion of Vitruvius, that the Greek temples were "*Sine tecto et sub divo*." But it would be pleasant to think that there was not such a hole in the roof of the Parthenon as people have been induced to believe. M. Viollet-le-Duc, in his second lecture on architecture, quotes a passage from Euripides. He says:—"In the tragedy of 'Iphigenia in Tauris,' Orestes and Pylades wish to gain an entrance into the Temple of Diana to carry off the statue of the goddess. Pylades proposes to penetrate into the cella through the openings left between the triglyphs. 'Look,' he says to Orestes, 'into the interval of the triglyphs where there is space enough for the body to pass through.' . . . . May not these openings left between the triglyphs placed at the top of the cella wall have been intended to admit light and air into the inner inclosure? This hypothesis would favour the supposition that the cella was completely covered in." Although to the inhabitant of Western Europe the absence of a closed window or door appears almost an absurdity, yet at the present day in Constantinople and Cairo the one is often filled with open perforated screens of wood, plaster, or marble, and the other with hanging drapery. Even in the houses of the English conqueror in India the doorways are often deemed sufficiently barred by a curtain suspended to about two-thirds of their height, the space over remaining open both day and night. Sombreness and gloom lend additional sanctity to a sacred spot; and just as the Mediæval ancestors of the Western peoples are known to have withstood cold draughts and similar discomforts in the inside of church, castle, and domestic dwelling, so the absence of any large circulation of air in an Eastern public building may have caused but slight inconvenience to those who only visited it periodically. No traveller who has wandered amongst sacred bulls and monkeys in the temples of Benares can admit that to the noses of the faithful a foul smell detracts from an accepted odour of sanctity, even with a people as much given to personal ablution as the Hindus. In their temples a small oil lamp is often kept continually burning; and perhaps the Mussulman habit of suspending inside the mosques long rows of gorgeous chandeliers, and the use of numerous candles of all sizes and decorations in Christian altars, point to a common traditional origin.

Xenophon, in the "Memorabilia," says that Athens at the time when it was subdued by Lysander the Spartan contained about 10,000 houses, B.C. 404. In his charming and instructive novel M. Viollet-le-Duc probably describes Athens at the period of its grandeur in the time of Pericles, whose political career dates between B.C. 469—429. The French writer's imaginative description of the Greek metropolis is equal to Sir Walter Scott's mediæval sketches. "It was around the Acropolis that the houses were crowded together, and the population always in activity. . . . The streets and public places in which people passed their lives presented a busy and noisy scene. . . . Women as well as men were to be seen in the streets going to the markets and the public games. . . . Houses of the higher class occupied the second zone. They generally possessed a garden, and sometimes outbuildings of considerable extent. Around them were to be seen clients and parasites waiting for the hour when the master should make his appearance; whiling away the time in discussing the news of the day, . . . and laughing among themselves at the passing strangers."

No traces of any domestic dwellings remain, and there are no means of ascertaining what they were except by analogy and conjecture. It is very much the fashion to refer to the Roman city of Pompeii for examples of Greek domestic architecture; and possibly its houses both externally and internally bear something more than the impress of Greek tradition. But it is well to remember that Pompeii was destroyed A.D. 79, and that consequently the disinterred city, as it is known to the archæologist, is more than five hundred years younger than Pericles, and the best monuments of Greece. Sir Alexander Grant in his essay on Xenophon, says that some of the features of ancient Greek society may often be observed in India. He pictures "Socrates in the person of some stout Brahman good humouredly lounging about in loose robes and with bare legs ready to discuss for hours with all comers any topic that may turn up"; and Socrates—the first lecturer extant, who identified the beautiful in architecture with the relative good—said that "paintings and frescoes on the walls of houses often detracted from their comfort, and therefore from their beauty, in necessitating the building of the walls in a particular way, by which the sun was too much excluded." It is certain that whether in the bazaar, the gharry, or on the plain, whether reclining, seated, or erect, the Hindu, with his long white dress and bare head, recalls to the mind of the traveller at least in Bengal much mental speculation concerning the ancient Greeks. His countenance may be more swarthy than theirs were; but at least their complexions were not so fair or delicate as certain Royal Academicians would have the world believe. If it be difficult, however, to realise the habits of life,—even with crowded Indian cities to inspire imagination,—of those who are called the "ancients," it is not difficult to perceive, from the writings of Cicero, that the separation between them and the "moderns" is far less real and obstructive than that which exists between the England of Magna Charta and of household suffrage. Cicero was born B.C. 106. He made his first appearance in the forum at Rome as an advocate at the age of twenty-five, and almost immediately afterwards he spent six months at Athens. He was as proud of his knowledge of Greek as any Englishman is of his French, and he interlarded his daily letters to Atticus with as much Greek as Thackeray contrived to admit of French into his later and less admirable novels. Forget the date, says an excellent essayist, and there is scarcely anything ancient about Cicero's writings. He was an art-collector probably more affected in the choice of rare articles than the most whimsical enthusiast of to-day, although undoubtedly less easily imposed upon. His friend Atticus, always *en voyage*, bought manuscripts, paintings, and statuary for him everywhere. Lord Elgin's vandalism was doubtless early capped by more than one Roman robber. Cicero had no confidence in other than Greek taste and design. He was ambitious that his country-house should resemble in plan the Academia at Athens, and he collected bits of sculpture,—even then, perhaps, called antique,—to decorate his library, which was the best room in the house, and full of books, for "Without books," he said, "a house is but a body without a soul."

ON THE ADAPTABILITY OF TERRA COTTA TO MODERN CHURCH WORK: ITS USE AND ITS ABUSE.*

BY MR. EDMUND SHARPE, M.A.

No doubt many will remember the lecture delivered by Mr. Roger Smith last year to the Institute on "New Building Appliances and Inventions," as well as the somewhat discursive but suggestive discussion which followed that lecture. It was, of course, impossible for Mr. Smith to do much more within the limits of an ordinary lecture than to give a general summary of these modern appliances; an account which his practical knowledge and personal experience in the use of many of them rendered extremely interesting. But no one who listened to the discussion which followed could fail to be struck with the variety and the extent of the information, of a special kind possessed by many who took part in it; and it occurred to me that, if, taking Mr. Smith's general summary as the basis for further action in the matter, different members of the Institute who had had special experience in the employment or treatment of any one of these arts or appliances, would each contribute by means of separate papers read at these meetings the result of his particular experience, and so give an opportunity for a general discussion, and the remarks of others, much useful information of a special kind might be brought together, which could not fail to have an important effect on the conclusions that might be arrived at in respect to the value or otherwise of such inventions, and the claims of each on the attention of the architect as a useful building material or appliance of the present time. And, in suggesting this idea to the Council of the Institute, I offered, if they approved of it, to do my part towards carrying the suggestion into effect by contributing a paper on the subject which is now before you.

In giving you the results of my experience of the treatment and use of burnt fire-clay,—an experience which is of very early, as well as of very recent, date; and my opinion of its suitability for church-work of the present day, to which I intend to limit myself, I shall do this as shortly as possible in order to afford more time for the observations of others quite as competent as I am to offer opinions on the subject; and in order to give opportunity for those questions and replies which often tend to throw more light upon a subject than a prepared discourse. It does not, therefore, enter into the scope of what I propose to say here to-night to make any reference to the history of terra cotta, nor yet to the nature of its manufacture, both of which subjects have, moreover, been largely treated of by others. My first experience of the use of terra cotta was in the church of Lever Bridge, near Bolton-le-Moors, designed by me in 1841, and my latest experience has been in the construction of the church of Scotforth, near Lancaster, designed by me in 1874, and finished in the beginning of the present year. A third building, the church of Platt, near Manchester, was carried out soon after that of Lever Bridge, and consecrated in 1846. Of other works in which I have employed the same material, it appears to me unnecessary to give the details, but I will describe those three buildings in the chronological order of their construction.

Lever Bridge Church.

Lever Bridge Church was constructed out of the fireclay deposits occurring in the colliery of the late John Fletcher, esq., of the Hollins, near Bolton-le-Moors. These deposits, in the form of small hard nodules, are generally found in the coal measures of that district. On exposure to the air they disintegrate and fall to pieces, and are then ground to powder, under heavy rollers, formed into a paste-like clay, and made into refractory fire-bricks for furnaces, coke-ovens, and similar purposes; this, at all events, was the only use to which this material had, up to that time, been applied. Mr. Fletcher, who was the chief promoter and the largest subscriber to the church at Lever Bridge, conceived the idea of building it entirely of this material, and I undertook to prepare the designs for it, and to superintend its construction.

The experiment was a bold, not to say a hazardous one, and its realisation was an extremely arduous affair. Kilns had to be built, and other necessary premises to be constructed; experienced workmen had to be engaged, and, above all, a competent and able modeller to be secured. It was, in fact, the creation of a new enterprise. Suffice it to say that, thanks to the indomitable perseverance of Mr. Fletcher, all was brought to a successful issue. The church was in due course commenced, completed, and consecrated in the year 1844. It was, I believe, the first work of the kind in modern times in which terra cotta had been used on so large a scale; for with the exception of the foundations and the rubble work between the outer and inner faces of the walls, neither stone nor bricks were used; and with the exception of that under the slates there is not a square foot of plaster in the building; the face of the walls inside and outside being formed of fireclay blocks, in 5-in. courses, well bonded into the rubble work, and built like an ordinary ashlar wall.

It is a small cruciform church, with an apteral or aisle-less nave, and a short chancel, north and south transepts, and west tower and spire. It is designed in the style of the early part of the Curvilinear period, circa 1320, with a spire of open tracery-work, crocketed pinnacles, deeply-moulded door and window jambs, parapet of open tracery, traceried windows, and all other detail characteristic of the period, fully carried out. The four arches of the crossing are formed of continuous arches of two orders, carrying the Curvilinear ball-flower in one of their hollows. A trefoiled arcade runs round the three sides of the chancel below, and the north and south walls above carry a series of crocketed tabernacle work having niches intended for memorial brasses. All these works are in terra cotta. The font, which is an octagon, richly diapered and panelled, is also in terra cotta; so also are the bench-ends, with their panels and finials; and so are the traceried panels of the seat-backs themselves, and those of the pulpit and organ-case. Indeed, the communion-table was originally a terra cotta structure, but it was objected to as uncanonical, and ultimately removed, and replaced by a wooden table, which, however, has now, under the influence of new ideas, assumed its super-altar, its candlesticks, its gilt cross, and its reredos. I have told you enough, I think, to satisfy you that when the upholders of stone and plaster, in derision, denominated this small church—which from one end to the other, inside and outside, shows nothing but terra cotta—*the Pot Church*—they had, apparently, some reason to do so. I say apparently, for, in point of fact, they had very little. And here I may tell you at the outset what is the real danger and objection to the use of terra cotta. It may be said of fireclay what has been said of fire itself, namely, that it is a very good servant, but a very bad master. It is the natural tendency of terra cotta to become *pottery*, and the natural tendency of terra cotta manufacturers to cause it to become such; the obvious duty of the architect in his treatment of it is so to deal with it as to preclude the possibility of this reproach. And although I will not go so far as to say that there is no part of this church where terra cotta is used that is not of the nature of stonework; yet I will at least affirm, that where it is artificially used, so as to resemble stonework, it has been so treated that the work is as solid there as if stone itself had been used. But I will be very honest with you, and point out all those parts and their mode of treatment to which this æsthetic objection may perhaps be raised.

I have told you this church was commenced in 1842 and completed, consecrated, and opened for public service in 1844. It is very easy to state this in a single sentence, but what is not at all so easy to do, is to describe to you all the difficulties we had to encounter, all the laborious work we had to go through, before this result was accomplished.

The three great difficulties which beset the terra-cotta manufacturer are the following:—

1. The danger of *warping*, either in the process of drying, or in that of burning the material.

2. The *shrinkage* of the material, varying as it does in amount according to the size and form of the piece.

3. The extent to which the piece had to be *fired* or burned, varying according to its size and form.

No doubt, the experience of the last thirty years has done much to reduce each of their difficulties to a minimum quantity, and there are manufacturers who will probably tell you that they have reduced these three problems to a matter of certainty, and who will guarantee to the architect the true execution of his designs according to the exact scale to which he has drawn them; but I must remind you that we had to encounter these difficulties in the year 1842, when there were no Doultons, and Blashfields, and Cliffs to perform this troublesome service for the architect. Many, in fact, were the experiments that had to be made, before we could venture to calculate with certainty that all the parts of a given portion of the design would come together, when set, with the accuracy of stonework. Take, for example, the lower portion of one of the aisle buttresses, it was easy enough to know the probable shrinkage of the coursed blocks of its masonry, but who was to predict beforehand the amount to which the upper and lower members of its base-mould would shrink? Experiments had therefore to be made which involved the preparation of moulds, and the forming, drying, and burning of the pieces before any degree of certainty could be obtained; and much was the work of this experimental nature that had to be gone through and thrown aside, before the true scale to which this detail work had to be designed could be accurately determined.

* This memoir, which was to have been read on the 29th of May to the Royal Institute of British Architects, could not be given in consequence of the adjournment to that day of the discussion on Concrete, reported in our last number.

I was, of course, anxious that, wherever it was possible, the terra cotta should be solid throughout; it was, however, found impossible in all cases to realise this. In the door and window jambs, arches and sills, and in the buttress set-offs, in the pinnacles, and in the base-course, the warping of the moulded lines, and the difficulty of thoroughly burning solid pieces of so great a size, obliged us to abandon the attempt, and to hollow out to a certain extent the back of the work, this hollow being filled in with concrete in such a manner as to render the whole perfectly solid. The most remarkable feature of the church, no doubt, is its traceried spire, which is built of solid terra-cotta from top to bottom, dowelled together, not with iron, which is much less durable, nor with copper, which is much more costly, but with terra-cotta dowels, which are imperishable. The six four-light traceried windows of the tower, transepts, and east end, and the two-light windows of the nave, are treated in the same way.

The church contains sitting accommodation for 350 persons, and cost, as it now stands, 2,600*l*. What it would cost in stone I never took the trouble to calculate; but the spire alone would, I should think, cost as much as the whole church has. Looked at as a piece of ordinary mason's work, it would be difficult to find a fault with it; nor would a stranger, seeing it for the first time, deem it, either from the appearance of its colour or its workmanship, to be anything else. Its primitive colour, when first built, was a ruddy buff, which is now considerably deepened by an exposure of thirty years to the smoky atmosphere of Bolton-le-Moors.

Platt Church.

Shortly after Lever Bridge Church was finished I was called upon by Mr. Thomas Worsley, of Platt Hall, near Manchester, to design another church in the same material, to be erected by him, at his own expense, close to his house in the township of Rusholme. The plan that I adopted for Platt Church was of a more Mediæval type than that of Lever Bridge, determined as I was to prove, that even in these comparatively parsimonious days, it was possible to reproduce, in this ductile material, a genuine example of the true Lincolnshire type of the fourteenth century, without stint as to the nature of the moulded and carved work with which its main features should be clothed.*

Now, this design, it must be explained, was made in the year 1844, that is to say, thirty-two years ago, and, therefore, very early in the Gothic revival, of which we now hear so much; about the time, in fact, when our late distinguished president was commencing his successful professional career, and when our present esteemed president must, I suppose, have been in his teens; and should you find any shortcomings in this design, you must put them down rather to the early period at which it was made, than to any incapacity of the material to produce a different result.

The experience gained in the construction of the former church much lessened our difficulties in dealing with the second. Their designs differ, however, considerably in character; the later church has less ornamentation, but it has clustered piers, floriated pier capitals, and moulded pier arches. It has a large five-light east window of flowing tracery, a diapered parapet to the aisle and clearstory walls, and a tower and spire, 170 ft. high. The whole of the exterior is of terra cotta, the coursed walling being of 5-in. blocks, as at Lever Bridge. The backing of the walls, however, is of brickwork, and the interior surface is plastered throughout. The spire springs from an octagonal lantern of particularly light work, which has suffered much from a cause that will be presently noticed. Altogether, I think, I am right in holding this tower and spire, considering the time at which, and the material of which it is constructed, to be a very remarkable work, and deserving of more care than it has of late received from those who have, under the Lord Chancellor, the charge of it. The whole work has been treated, as will be seen, as a work in masonry, and I believe very few of those who live in the populous neighbourhood in which it stands are aware that it is not so. All that has been said before in regard to what is solid and what is hollow in Lever Bridge Church applies equally to this church. Platt Church contains 650 sittings and cost, exclusive of the stained glass, about 4,000*l*.

* A view of this church we shall give in an early number.

Now before I begin to describe to you the third church, I will, if you will permit me, make a few general remarks on the use of terra cotta as it has been employed in the two churches which I have already described. And first, as to its durability, I have no occasion to tell you that of all materials, natural or manufactured, there are few that are so durable as terra cotta; the examples of it, some thousands of years old, that have turned up in Egypt, Assyria, and elsewhere, prove this beyond a doubt. But it is so on one condition alone; namely, that it be, in the language of the trade, thoroughly "fired." We were fully aware of this condition when we commenced the work for Lever Bridge, but we were hardly aware, at first, of the much larger proportionate increase of time in burning to be given to the larger pieces, in order to ensure their complete induration. The defect only made itself apparent after the material was built into the work, and a considerable number of pieces have accordingly had to be taken out and replaced. This has by degrees been done, and the church is now in a sound condition throughout. At Platt Church, on the other hand, where, in consequence of these failures, the whole work was much more thoroughly burned, a much more satisfactory result was obtained. I have recently inspected the church, and with the exception of certain defects in the spire and upper part of the tower, due to other causes, the whole of the church, nave, aisles, and choir are in excellent condition, and as sound apparently as the day they were built: a result which is entirely due to the greater extent to which the material was fired. This necessity for long and hard burning is diminished in proportion as you diminish the body of the clay, by hollowing out the back of the piece, and render it to that extent less solid; but here we fall upon another evil almost greater than the first, for it is pre-eminently unsatisfactory to reduce the ornamental part, or show-side, so to speak, of the block to the condition of a shell, whilst honest stone or concrete does duty at the back as the real masonry of the building. I need scarcely say that this is not the manner in which the terra-cotta used in these two churches has been treated; still there must always be the tendency on the part of the manufacturer to ensure the durability of his material by lessening the amount of its solidity, a result which goes far to prove that to employ this material in these large masses is a use of it which is in a direction, and of a nature, opposed to its natural capabilities.

It was this consideration which determined me, should I ever have occasion to use terra cotta in church work again, so to use it as to ensure the complete burning of the whole work with a moderate amount of firing; or, in other words, to use only small pieces throughout the whole building, and to limit them, in fact, to the following dimensions: namely, for the ordinary walling blocks, 9 in. by 4½ in. by 4 in., giving a cubical content of 162 in.; and for the largest pieces of ornamental work a maximum of 400 cubic inches; and thus, instead of obliging the terra cotta to suit the design, so to prepare the design as to suit the terra cotta.

Now it is obvious that this limitation in the size of the blocks to be used is inconsistent with Gothic work of the kind that was prevalent in this country in the thirteenth and subsequent centuries. Indeed, the massive effects that we see realised in Norman work were produced by stones much smaller in size than those which were used in certain situations in Gothic work. But still better adapted to the condition which I have just ventured to lay down, is the work of that period which I have endeavoured in my recent publications to call special attention, and which occupied the latter half of the twelfth century. For in this Transitional work, especially in that lighter description of it which was executed towards the close of the Period, we find in its mechanical ornamentation, and in the repetition of parts in its moulded and carved work, exactly those conditions which adapt themselves to the principle in the use of terra cotta which I propose to prescribe.

It was long, however, before the opportunity presented itself for putting this idea to the test of practical experiment. In 1847 I transferred the chief charge of my professional business to my pupil and partner, Mr. Paley, and shortly afterwards retired altogether from practice as an architect.

The year before last, however, I became one of the chief promoters and subscribers to a small church that was to be erected in my own township of Scotforth, and within 300 yards of my own house, and I considered myself justified, under these circumstances, not only in preparing the designs of this church, as an amateur, but also in attempting to realise the idea I had conceived thirty years ago, by the help of which we might hope, with our limited means, to produce a structure of greater comeliness and ecclesiastical character than we could expect to accomplish were we to use exclusively the grit stone of the neighbourhood. It is to the manner in which terra-cotta is used in its construction, that I have now to call your attention.

St. Paul's Church, Scotforth.

This is a small church, of the usual plan, with nave and side aisles, clearstory, south porch, chancel, and circular apse; the only unusual feature about it being the situation of the tower, which is over the chancel,—a position in which it is more frequently seen in France and England. The church is built of flat-faced rubble walling, with terra-cotta dressings; the colour of both being very similar. It is designed in the style of the latter part of the Transitional period, *circa* 1170.

The works executed in terra-cotta are the following:—Inside, the piers, with their bases and capitals; the pier arches; the string-course above them; the roof shafts, with their corbels and capitals; the two chancel arches; the chancel arcade; and the vestry doorway. Outside, the clearstory windows; the circular wheel window at the west end; the doorway of the south porch; the corbels of the nave and apse roofs; the apse arcade; and the whole of the upper part of the tower, with its saddle-back roof.

The whole of this work was modelled from my own drawings, under my own eye, and moulded, burnt, and furnished, by Messrs. Cliff & Son, of Wortley, near Leeds. Every piece of this work with one exception, is solid and solidly built into the walls, just as if it were of stone; there is no hollow work of any kind, with the single exception above noticed, and no veneering of any kind. The terra cotta essentially forms part and parcel of the body and strength of the structure. No piece contains more than 400 inches in its cubical contents. The external walling of the tower being of blocks, measuring 9 in. by 4 in. by 4½ in., backed with ordinary brickwork set on edge, the two being securely bonded in, one with the other.

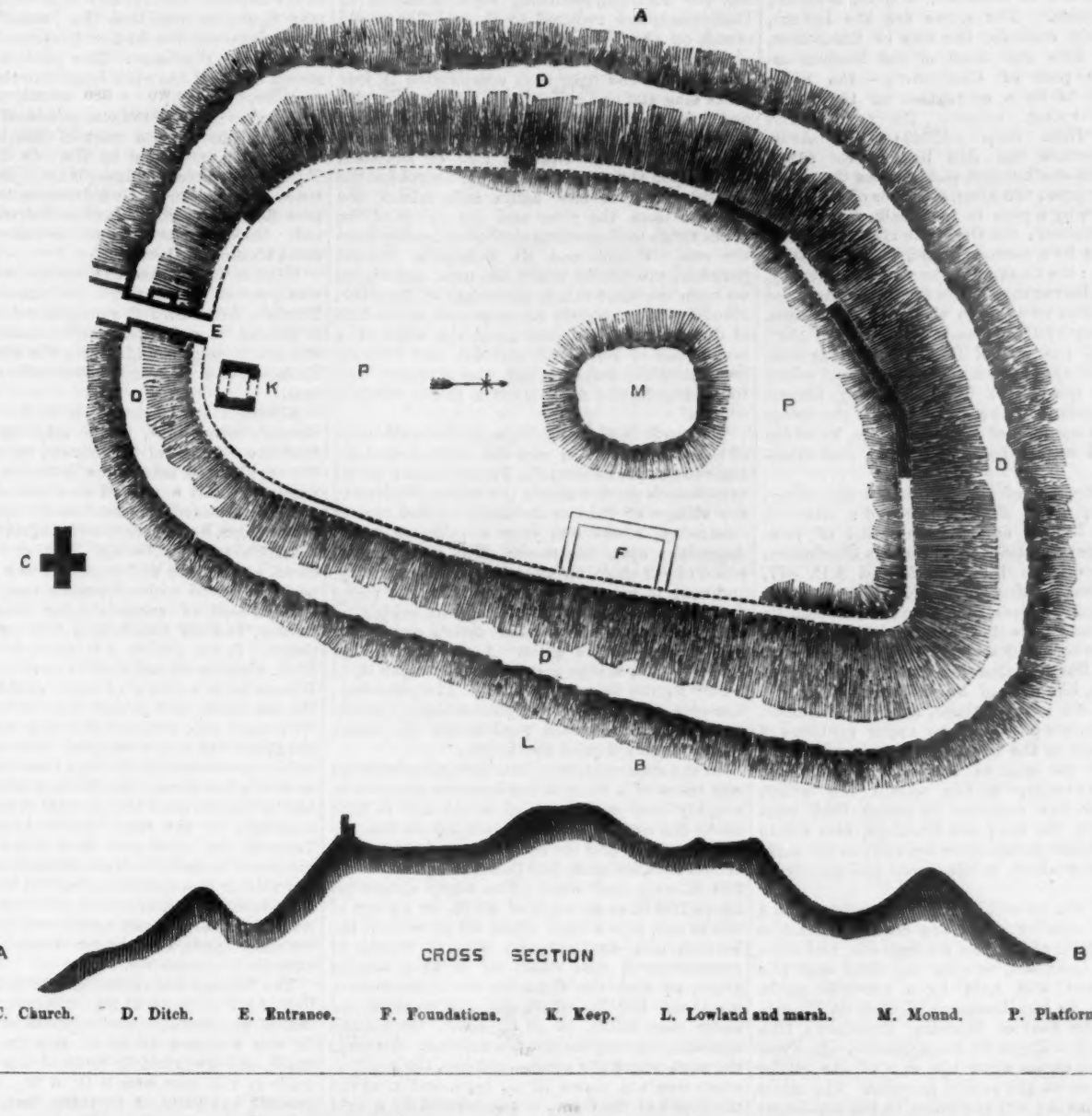
The material, as regards colour, is unexceptionable; of a warm cream colour, of the very best stone colour; and this is not only on the surface, but throughout. Burning does not darken or change the colour of the block internally, as is the case with some fireclay. It requires no special preparation other than that to which all other brick-clay is subjected. It will carry a great amount of heat in burning, and possesses, when burnt, all those proofs of durability which well-burnt fireclay ought to exhibit; it rings well, is extremely hard, and resists both the chisel and the penknife; it has already obtained an extensive reputation as a refractory fire-brick. It comes out of the coal measures at Wortley, near Leeds, where it occurs as a stony shale in beds of about 2 ft. in thickness.* Its texture is one that is agreeable to the eye, and which takes mortar well, and is therefore well suited to architectural purposes; but it has never yet been used on the scale and in the manner in which I have employed it in Scotforth Church; and it is because, as used in this little building, it has been, so far as I can now judge, a successful application of it, and because the experiment is one that may be useful to others, and in the employment of other fireclay elsewhere, that I have ventured to bring this design and its execution before the Institute,—a design which, *au reste*, is sufficiently modest, and which, except on this account, would have few claims on attention.

There are several different depos'ts of this material at Wortley, and several different fire-brick and chimney-top makers. Messrs. Cliff & Son, however, are the manufacturers who have supplied the whole of the work required for this church, and I have every reason to be satisfied with the manner in which they have executed their contract.

The church affords sitting accommodation for 300 persons, and cost, exclusive of the site and fence-walls, but including every other item,—pulpit, font, heating apparatus, and lightning conductors,—2,800*l*.

* For a description of the qualities of this Fire-clay and its Manufacture, see the *Builder* of May 2nd, 1874.

BRAMBER CASTLE.



C. Church. D. Ditch. E. Entrance. F. Foundations. K. Keep. L. Lowland and marsh. M. Mound. P. Platform.

THE CASTLE OF BRAMBER.

Of the shires of England there is none more intensely English than Sussex. Its name, the names of the most central of its two capital towns, of its principal and secondary divisions, of its parishes; nay, even of its fashionable watering-places, and in a very remarkable degree of its inhabitants, are but little changed from those they bore on the eve of the Conquest, and when under the sway of Godwin and Harold. Even the not infrequent marks of Norman occupation, in the form of parish churches, abbeys, and castles of great strength and durability, were many of them grafted upon foundations dating from the days of Alfred and Egbert. This is the case with Selsey, the ecclesiastical parent of the see of Chichester, with Bosham, Malling, Steyning, and other religious houses; and Arundel, Bramber, Knappe, Hastings, and Lewes, all great castles in their day, were the seats of English chiefs for centuries before their banks were crested with walls of masonry, or their mounds crowned with keeps constructed after the Norman pattern. Pevensey, indeed, boasts a still earlier origin. Its walls are, a part of them, Roman, as its earthworks are, a part of them, of English construction: it received from the Normans only its latest additions.

British remains in Sussex are but scanty. A few of the larger and more elevated of the hill-camps, and those of irregular form, as Cissbury, which includes 60 acres, are supposed to be the work of the Regni, the earliest recorded inhabitants of the district. It is also difficult not to see in the Arun, the Adur, and the Ouse names corresponding to the Aeron, the Dour, and the Esk, by which many streams in Celtic countries are still designated. Glynde has been claimed as a Celtic name, but it is very rare, especially in Sussex, to find the name of a parish of other than Teutonic origin.

Of the Roman period the traces are more numerous. The main road intersecting the county from Chichester towards London is undoubtedly of that date, and there seems to have been at least one other from Chichester—the Roman Regnum—to Pevensey. There remain also several rectangular camps, as Goushill, Hollingbury, Ditchling, Highdown, and Brighthelmstone Down, evidently Roman. Chichester, though its Latin name probably includes an earlier appellation, has the Roman cruciform arrangement of its two main streets, though not the rectangular outline. Anderida, Mutuantoris, and Mida, Roman towns of which the site is disputed, seem to have been in Sussex; and at Bognor and other places, pavements and foundations and inscribed stones, and other marks of Roman habitation, have been discovered. Still, the remains, whether of British or Roman occupation, are but slight: all that speaks of law, of order, of property, of the family tie, of the forefathers of the people, of civil or religious polity, and of public worship—all of this character is ancestral, is English. This thorough uprooting of the traces of earlier occupation is due, no doubt, to the position of Sussex upon that part of the British coast most exposed to Saxon and Danish invasion, and which bore the attacks of those formidable invaders when at their earliest and fiercest. Sussex was late to come under the humanising influences of Christianity, remaining Pagan till the middle of the seventh century. The remarkable conservation, to our days, of the names and divisions is probably due to the very peculiar configuration of the district, and to the isolation produced by its steep and lofty frontier ridges, and by the dense woodland which covered, and to some extent does still cover, its central part. As the position of the principal castles is determined by this configuration, a few words concerning it will not be out of place.

Sussex forms the western half of a chalk basin. The chalk rises in a long, narrow, lofty, and very steep ridge, forming the northern, eastern, and southern margins of the area, its height, reaching to 800 ft., being known as the downs. The North Downs divide Sussex from Surrey, the South Downs are the frontier towards the sea. This latter ridge extends from near Chichester to Beachy Head, while the North Downs extend to Folkestone and Dover. The deep wooded area thus enclosed between them is the well-known weald of Sussex. The basin is cut across obliquely by the sea, and the south-eastern frontier of the county thus laid open for a length of about fifty miles. In former days, however, the broad marshes of Pevensey, Winchelsea, and Romney closed this opening with a barrier as effective as the Downs themselves.

Upon these Downs, and especially upon the range to the seaward, the early sea-kings seem to have pitched their resting-places. Here are still found such hill-camps as Woolstonbury, Caburn, Rookshill, and Cheukbury, circular in form, and therefore neither British nor Roman, and besides these, several others, as Newhaven, Seaford, and Burling, which are segments of circles, and, like Flamborough Head, enclose headlands, and are attributed, with some probability, to the Danes. It seems the general opinion that these circular or segmental earthworks preceded the mounds and banks found in the interior of the country and upon lower ground, the work of the same people after their settlement and civilisation.

Sussex is the only county the primary divisions of which bear the names of Rapes; of these

it contains six: Hastings, Pevensey, Lewes, Bramber, Arundel, and Chichester, subordinate to which are sixty-five Hundreds; each rape contains a portion of seaboard, a river, a haven, and a fortress. The rivers are the Lavant, which nearly encircles the city of Chichester, and falls into one head of the Bosham estuary, the port of Chichester, — the name is thought to be a corruption of the Saxon *hlifian*, a rising, because the springs rise annually from deep sources; — the Arun, which descends the dell bearing its name, cleaving the chalk-range, and reaches the sea at Little Hampton; the Adur, the river of Bramber, which also, by a pass in the chalk, reaches the sea at Shoreham; the Ouse, the river of Lewes, which, also by a narrow gorge, joins the sea at Newhaven; the Cuckmere, the river of Pevensey, but which leaves that haven far to the east, and descends, also by a gap in the chalk, to the sea, west of Beachy Head; and, finally, the Rother, the river of the rape of Hastings, but the common boundary of Sussex and Kent, and which falls into the sea at Rye. Pevensey Haven, though deprived of the Cuckmere, is the receptacle for a number of lesser streams, by which the upland waters formerly flooded that extensive level.

The fortresses of the Rapes are also six,—Chichester, long since destroyed; Arundel, Bramber, Lewes, and Hastings, all of præ-Roman date; Pevensey, and probably Chichester, of Roman origin. Ella, who landed A.D. 477, took possession of Chichester. All were the seats of English lords, and all were accepted by the Normans as well-chosen positions, and by them were occupied and strengthened. Knepp or Knapp Castle, subordinate to Bramber, in the same rape, like it, is of English origin.

Of the six castles, three, Arundel, Bramber, and Lewes, are posted at the upper openings of narrow gaps in the chalk downs. Chichester is placed to the east of and outside the chalk range. Pevensey stands within the weald, among the low marshes by which that tract opens upon the sea; and Hastings, also within the weald, stands upon the sea-cliff, on the rocks and sands to which it has given geologically its name.

All the six, as well as Knepp, possessed, on a larger or smaller scale, the conical mound so characteristic of English strongholds, and each, after the Conquest, became the chief seat of a barony, and was held by a powerful noble. Robert de Eu had Hastings; William de Warren, Lewes; the Earl of Moreton, Pevensey; Chichester fell to Roger de Montgomerie, who there founded a castle upon the site of the earlier works, of which the mound remains. The castle stood within the city enclosure, in the north-east quarter. It became, with Arundel, the property of the D'Albinis, and was destroyed by order of King John, after which the third Earl of Arundel founded on its site the Grey Friars, of which the house was probably built with the materials of the castle. It is said that upon the mound stood a circular or polygonal keep, as at Arundel, and that the traces of its foundations were long visible on its summit. The mound has survived all its Norman additions, and is the only relic of the ancient fortress that is extant. The city, within which the castle stood, is also an early strong place. The cruciform streets are, doubtless, Roman, as are the coins and inscribed stones occasionally dug up; but the outline of the city is not rectangular, and is enclosed within a bank and ditch of irregular outline, once of formidable strength, and still in parts tolerably perfect. It is not improbable that these earthworks are post-Roman, the work of the Romanised Britons, and therefore earlier than the date of the castle mounds. The later wall was built against the bank, which thus still, where it remains, forms a broad ramp or terrace.

Arundel Castle, next eastwards to Chichester, and its superior in military importance, stands on the right bank of and high above the Arun. The pass is of a more open character than those to the east of it. This castle has already been described in the pages of this journal.

Knepp Castle is in Shipley parish. It had a shell keep upon the mound, of which traces remain, but which is said to have been destroyed as early as 1216.

Bramber, the castle next eastwards of Arundel, is held to be the English "Brymmburgh," a fortress upon a brim or brink. It is, or rather was, the head of a barony, and the chief place of the Rape to which it has given name, and which includes 42 parishes. The Rape extends about twenty-four miles from the Surrey border to the sea, with a width of about eight miles. Narrow as it is, it contained till 1832 the four Parliamentary boroughs of Shoreham, Bramber, Steyning, and Horsham, returning eight members to Parliament, now reduced to three. The castle stands on the west side of, and just above, the channel by which the Adur reaches the sea at Shoreham. The pass thus commanded is four miles long and half a mile wide; the bottom flat and marshy, the sides very steep and rising to 600 or 700 ft. New Shoreham, founded about A.D. 1200, by the Norman lord of Bramber, stands upon the seashore; but old Shoreham, the English port, is now half a mile inland, the deposits from the river and the *débris* of the chalk range having encroached considerably upon the sea. Combe and St. Botolph's, ancient parishes, are placed within the pass, and higher up upon the same side is the village of Bramber, standing upon slightly rising ground at the foot of the western hills, and upon the edge of a broad tract of level land, still wet, and formerly impracticable, across which the sluggish and frequently flooded Adur takes a rather winding course.

The castle is placed a little to the north-west of the village, and, as was the English custom, close to the parish church. From thence a raised causeway is carried across the valley, leading to the village of Sele or Beeding, the Bedinges of Domesday, where was once a religious house dependent upon the castle. The village, composed of one short street, adjoins the causeway, and near it was discovered, in 1839, the piling and piers in masonry of an ancient bridge by which the road was carried across one of the bye-streams of the Adur. A charter of 1075 refers to this bridge and to a chapel upon it, as "Stus. Petrus de veteri ponte." The causeway, however, claims to be of higher antiquity, and to have carried a Roman road across the marsh then probably flooded by the sea.

In the construction of the fortress advantage was taken of a knoll of the lower or grey chalk, roughly oval in figure, and about 120 ft. high above the river. This was levelled on the top and scarped round the sides so as to form a more or less rounded area, 560 ft. north and south, by 280 ft. east and west. The scarp descended above 180 ft. at an angle of 45 ft., or a slope of one to one, into a ditch about 20 ft. wide at the bottom, and the opposite side of which, or counter-scarp, rose about 40 ft. at a similar angle, so that the ditch at the counter-scarp level was 100 ft. broad, and the crest of the scarp rose 30 ft. to 40 ft. above the ground opposite. A very formidable defence. Towards the east, where the ground was low, the counter-scarp was not above 20 ft. high, and to add to the depth of the ditch, it was crested by a light bank, from which the ground sloped towards the marsh. On the north and north-west, where the ditch was at its deepest, and the ground was high, the slope outwards is gentle, falling for a furlong or so. To the west, where there is a valley now occupied by the railway, the ground is low, and here the outer side of the ditch, forming the crest of the counter-scarp, is a narrow ridge, as at Arques, succeeded by a very steep slope. Thus those who approached the place on that side, after toiling up a steep and dangerous ascent, would only find themselves on the outer edge of a deep ditch, with a second still higher and steeper ascent beyond it. Towards the south the ditch crosses instead of skirting the hill, and is much less deep. Here was the entrance, and upon the small tail of the knoll thus cut off is placed the parish church, standing therefore, just outside the ditch, and in its turn defended by the slope of the hill, and by a hollow way which runs a few yards within the edge of the marsh, the level of which is 8 ft. or 10 ft. below it.

Upon the table summit, 160 ft. from its northern, and 40 ft. from its eastern, margin, was thrown up a conical mound, about 40 ft. high, and 70 ft. diameter at its summit. It is wholly artificial, and the material has evidently been scooped up from the surface of the area, which has thus been rendered slightly hollow, the surface rising gently towards the mound, and towards the outer margin of the area, that is, the crest of the scarp. The mound does not appear to have had any ditch proper to itself. It has been dug into and disfigured on its southern side. Possibly there have been buildings there. On the north the original and usual form is untouched. The slope is very steep. This was the "burgh" or keep of the original fortress.

What stood upon the burgh, or how the margin of the area was originally defended, is of course a matter of conjecture; but considering the wealth of timber in the district, it is probable that the defences were all of that material, as well as the adjacent church, and thus supposing, we may figure to ourselves the "aula" of Earl Guerd, who was the lord of Bramber during the reign of the Confessor. The position is a very strong one, and the view from it to the east and north-east extensive.

Bramber is one of the castles named in Domesday. It was then a part of the lordship of Washington, and held by Wm. de Braose, the Norman grantee. "Ipse Wills. [de Braiosa] tenet Wasingetune. Guerd comes tenuit tempore Regis Edwardi. Tunc se defend. pro LIX. hid. Modo non dat geldum. In una ex his hidis sedet Castellum Brembre."

William de Braose here mentioned probably was present at Hastings. A charter cited by Dugdale, dated 1075-6, shows him to have been of Braose, near Saumur, on the Loire. He had an immediate grant of nearly the whole rape of Bramber, and he adopted the castle as his chief seat.

Although local history is silent as to De Braose's operations, much may be extracted from the evidence of the existing ruins. Around the edge of the table area he or his immediate successor built a wall of *enceinte*. Where the ground was sound, this was founded upon the edge of the slope, but where the chalk had given way, the foundations were laid 3 ft. or 4 ft. lower down, so that the wall was built as a revetment, and the ground within formed a ramp against it. Of this wall of *enceinte* some large portions remain, and its foundations may be traced all round. It was 7 ft. to 9 ft. thick, from 10 ft. to 18 ft. high inside, and outside from 20 ft. to 30 ft. It was built entirely of large pebbles, as from the sea-beach, laid in very thick beds of mortar. Of course, such stones could have no bond, and are about the worst material that could, under ordinary circumstances, have been selected, but so firm is the mortar that the wall remains sound, and in places, even the parapet, 2 ft. thick, and composed of the same material, is standing. Towards the north-east is a sharp angle, and another of some boldness towards the south-west, but neither there nor elsewhere do there seem to have been any mural towers, although it must be confessed that a dense underwood of thorn and bramble renders a closer inspection of the exterior impracticable.

The Norman keep stood upon or just within the line of the *enceinte*, at its south end, close to the east of the entrance, and opposite to the church. It was a square of 40 ft., standing north and south, and about 240 ft. south of the mound. Its walls at the base were 9 ft. 6 in., and at the summit but little, if anything, less, and its exterior face was vertical. The basement chamber at the ground level was 21 ft. square and 14 ft. high, and above it were three stages, all with timber floors. The height to the rampart wall is, by guess, about 70 ft., or a diameter and three-quarters. The first floor, 23 ft. high, either rested upon joists which were supported by the north and south walls, now gone, or, which is more probable, upon a ledge in the wall, which is reduced in thickness at that level about 6 in., as seen on the west side. Only the west wall remains, and the lower 6 ft. or 8 ft. of the east wall. The north and south walls are entirely removed. The west wall is solid at the base, but the east wall is recessed in a curious way inside, and seems besides to have contained two cavities like cess-pits. The whole mass has, however, been so pulled about, that little can be made of it.

At the first floor, also, the west wall is solid, save that in its south end is a short mural passage, vaulted, which seems to have ended in a garderobe, the vent of which is marked by a sort of vertical furrow in the wall. This passage was probably entered by a door in the south wall, near the south-west angle. The east floor, 19 ft. high, rested upon six joists in the east and west walls. In its west wall is a full-centred recess, 3 ft. deep, 2 ft. above the floor, 5 ft. wide, with jambs 7 ft. high. In the recess is a window 3 ft. wide, with jambs 5 ft. high, also full-centred. Both recess and window are quite plain, and are not splayed.

The third floor, 14 ft. high, also rested on six joists, east and west. This has no window to the west, but in the wall are two recesses for the vertical beams of a roof, and at the base of each a corbel. This looks as though the roof was inclined, as at Bridgnorth and elsewhere, at a low pitch, the north and south walls being its gables.

There are some indications, in a foundation, as of a forebuilding attached to the north face,

where probably was the entrance. The material of the keep is chalk flint, laid in copious beds of mortar. The flints are undressed, and the workmanship is coarsed rubble, very plain and good, but rather rough, with a tendency to herring-bone work. The window is dressed with ashlar, as are the hollow quoins of the interior, but there is no ornament, not even the usual Norman pilaster or plinth. The ashlar is probably the malm rock of the neighbourhood, a bed below the chalk, much like that used at Dorchester, and for some of the adjacent Oxfordshire churches. Altogether, this keep seems to be Early Norman work, perhaps as early as Malling, and was probably built by the first De Braose before 1095, when his son was in possession.

When the keep was blown up, as it evidently was, with powder, the south and east walls fell in four or five huge masses into the adjacent ditch, where they remain but little altered, though obscured with vegetation. If these were cleared, something more of the detail of the keep might be discovered. The north wall seems to have been broken up and removed.

About 40 ft. west of the keep are the remains of the entrance. So far as can now be seen there was no considerable gatehouse, probably only an arch in the curtain, as at Richmond. The fragment of a wall shows the approach to have been steep, and about 40 ft. from the gate was a bridge, the pier and counter-pier of which, 13 ft. apart, are still standing in the ditch, here not above 90 ft. wide and 30 ft. deep. The approach to the counter-pier rises steeply from the foot of the hill and passes the church.

The only building of which there are positive traces, besides the keep, within the area, was a rectangular pile, built upon the curtain, 60 ft. long, and projecting 24 ft. into the area. This is placed opposite to and east of the mound, and the passage between the two was only 15 ft. broad. A part of the base of this building remains, and shows a plinth and fragment of wall faced with squared flint. The work looks many centuries later than the keep, and most certainly is not Norman. There is no trace of a well.

The parish church shares the protection of St. Nicholas, in common with Old Shoreham. It is in substance Norman, probably rather later than the castle, and was originally a cross church with a central tower. The nave and central square remain, but the choir and transepts have been removed, and the arches blocked up. The south door of the nave has a plain billet moulding, but the original opening has been walled up, and a smaller segmental doorway inserted. The cruciform plan seems to have been much in use here. It is seen at Old Shoreham, Steyning, and Broadwater.

Bramber has little or no history. The lords were among the wildest, most turbulent, and most unfortunate of the Norman barons. Their founder, William de Braose, received from the Conqueror forty-one lordships in Sussex, chiefly in this Rape, and others in Dorset, Hants, Berks, Wilts, and Surrey. He founded St. Peter's Priory, at Sele.

Philip, his son, adhered to Rufus, but was opposed to Henry I., and was disinherited. He married Aanor, and left William, who married Berta, daughter of Milo, Earl of Hereford, with whom he had Brecknock, Gower, and other south Welsh lordships, and thus laid the foundation of much of the power and more of the misfortunes of his race. His descendents built the strong castle of Oystermouth and that of Swansea.

William, the grandson of the founder, recovered the estates and added to them by marriage a share of the Honour of Barnstaple. He founded New Shoreham Church and Port. He also joined in the invasion of Ireland with Henry II., and held the whole kingdom of Limerick in fee. He is accused, though upon scanty evidence, of a wholesale massacre of his Welsh neighbours at Abergavenny. His possessions in England, Wales, and Ireland were enormous, and he also held the Honour of Braose in the Bailliewick of Falaise, in Normandy, and a share of the Honour of Totnes, which he obtained with Maud de Hayes or St. Valerie, a daughter and co-heir of Joel of Totnes. For some reason, not very clearly ascertained, he became obnoxious to King John, and their strife, much embittered by the outspeaking of his wife, led in 1210 to his attainder and exile and the death of his wife and William their son, it is said of starvation, in the prison of Windsor Castle. He himself died at Paris shortly afterwards, in 1212. He was a considerable benefactor to the Church, and it is recorded of him that he was careful to use God's name with great reverence. The king seized the Rape of Bramber, and granted the Barony to Richard, Earl of Cornwall. Giles, Bishop of Hereford, and Reginald de Braose, brothers of the attainted baron, obtained after a time a share of the estates. Bramber was granted to the Bishop, who however died within the year. Finally, in the reign of Henry III., Reginald recovered Bramber and Knepp, and most of the rest of the property, and having married Grecia, daughter of William de la Bruere, died 6th Hen. III., and was succeeded by William his son.

William de Braose married Eve Mareschal, a co-heir of the great Earl. He fell into the hands of Prince Llewelyn, who accused him of too great intimacy with his princess, and put him to death at Builth, it is said, by hanging. He left four daughters co-heirs, whose descendants held the greater part of the estates.

There remained, however, an heir male, in John de Braose, by Maud de Clare: he was the son of that William who was famished with his mother at Windsor, and who recovered Bramber and Gower. His son was William de Braose, who held Bramber and Gower, and added considerably to the Sussex estates. He is said, in 1262, to have raised a large sum of money from his tenants by foregoing his right of murage. He died at Findon, 1290, 19 Ed. I., and was succeeded by John de Braose of Bramber, who married Margaret, daughter of Llewelyn, Prince of Wales. He died at Bramber of a fall from his horse (16 Henry III., 1232), and was succeeded by William, who died 19 Edward I. William was followed by another William, the eighth and last lord in descent from the founder. He was a powerful baron, and active in the wars of Edward I. and II. He was, however, extravagant, and reduced to sell Gower, which led afterwards to disputes between the purchaser and the lawful heirs of the vendor, of whom Aliva, his elder daughter, married John de Mowbray, from whom descended, in the seventh generation, Margaret de Mowbray, who married Sir Robert Howard, whence descends the Duke of Norfolk, the present owner of Bramber Castle. The barony is in abeyance. Probably, with the failure of the elder male line of De Braose, the castle ceased to be a residence, but in 1644 it was strong enough to be held by Captain James Temple, for the King, against a strong Parliamentary party, and it was probably in consequence that the keep was blown up, and the castle reduced to its present condition. There is an engraving by Hollar, taken 150 years ago, representing it very much in its present condition.

Another branch of the family of de Braose rose to the rank of Barons of Parliament, and held large Sussex possessions. The last male of this cadet branch, de Braose of Chesworth and East Grinsted, died in the reign of Richard II.

Bramber is like Pontefract, Lewes, and Dudley, an example of a natural hill, scarped and defended by art, and crowned with an artificial mound, but unlike those castles, it has both a mound and rectangular keep, a rare combination, found only at Guildford and Christchurch. A rectangular keep upon a natural isolated hill, unaccompanied by a mound, though not usual, is not very infrequent. Examples of it are seen at Hedingham, Corfe, Bridgnorth, and Brough. At Bramber, as indeed in the case in many other sites of early fortresses, the original earthworks have survived the Norman additions, and remain pretty much as they must have existed before the Conquest. G. T. C.

MODERN IMPROVEMENTS IN HOUSE BUILDING.

ARCHITECTURAL ASSOCIATION.

IN the discussion which followed the reading of Mr. J. Douglass Mathews's paper,*

Mr. W. W. Robertson, in moving a vote of thanks to the reader of the paper, said he thought the practice of giving a separate supply of air to the fireplace, by means of a tube or similar contrivance brought from the outside of the house to the underside of the fireplace, could not be too strongly condemned, on the ground that as the fireplace was generally the chief ventilating agent in a room, an independent supply of air to it would neutralise its ventilating functions at once. It might be true that, where the fireplace was not provided with an independent supply of air, there would be slight draughts, caused by the air being drawn through the doors and window-frames, but these draughts were to be preferred, in his opinion, to a foul and stagnant atmosphere. He believed that there was much to be learnt from an examination of new inventions, and it was worthy of note that of the 5,000 patents taken out every year, a large proportion were in respect of inventions connected with building materials and appliances. A very elaborate contrivance had been invented by Professor Reynolds, of Owen's College, Manchester, for effectually disconnecting soil-pipes from house-drains, and this, in a simpler form, was likely to be of general use. Among the inventions not specified by Mr. Mathews, he believed that the pneumatic bells, lately introduced, had been found to answer exceedingly well.

Mr. R. Morrison Marnock seconded the vote of thanks, and observed that a great disadvantage of pneumatic as well as of electric bells was that as there was only one gong, the servants could not tell from which room the summons had been given, except by going to look at the indicator. For this reason Mr. Hardwick had, in the house which he had just built for Mr. Millais at Kensington, while using electric bells generally throughout the house, determined to have three bells, viz., those from the entrance-hall, the dining-room, and the ladies' boudoir, fitted with wires and cranks in the usual manner, each bell having its own distinct tone. With regard to stoves, he thought the ventilating stoves introduced of late years were excellent things. As to giving the stove its own independent supply of air, he took it that the air coming in under the fireplace would not all be absorbed by the fire, but that part of it would circulate in the room.

The President (Mr. John S. Quilter) said it occurred to him to mention a mode of utilising the heat from a chimney flue which he had seen illustrated, but which he had never heard of being carried out in practice. The flue was made in the form of a terra-cotta tube or pipe carried up in a recess which occupied the place of the ordinary chimney-breast. He thought it obvious that this was an economical and simple mode of increasing the warming power of the stove.

Mr. Phené Spiers said he had seen stoves of the kind in use in Belgium, and they seemed to answer their purpose very well, but they had the disadvantage of projecting into the room,—a disadvantage which was, perhaps, more than counterbalanced by the effectual manner in which they warmed the apartments in which they were placed. The subject of ventilation was too large to be entered upon in a comprehensive manner in the course of a discussion. A great deal had been said of late with respect to the system with which the name of Mr. Tobin was identified. There was no doubt much credit due to Mr. Tobin for the persistency with which he had urged the necessity of ventilation, but the system which he claimed as his own was no new thing. He (Mr. Spiers) remembered the principle being advocated some twelve years ago. One of the members of the Institute wishing to have a "fling" at the Renaissance architects, and at the same time to suggest a means of improving the ventilation of the Institute meeting-room, suggested that pipes should be carried up from the external air through the pedestals and the empty-headed busts of the Renaissance architects which are placed at intervals along the walls of the room. There was Mr. Tobin's principle in its entirety. Mr. Spiers having cited an instance in which this mode of ventilation had been carried out as far back as ten years ago, said that although the principle was good, it had one defect, and even Mr. Tobin did not claim that it did more than dilute the air. Of course, the best possible principle of ventilation would be that which would quickly remove all vitiated air and replace it with fresh air; but perfection had not yet been attained in ventilation. Mr. Tobin's principle did not admit of the removal of foul air, or of the supply of absolutely pure air. He regarded Mr. Tobin's claims to priority of invention in this direction as preposterous. He knew that many architects had for years past carried out the same principle of ventilation, and that they were continuing to do so, regardless of Mr. Tobin's pretensions. As to the shrinkage of timber in modern houses, he did not know how it was to be prevented, seeing that the bulk of the timber used in modern work was brought wet from the dock, and cut up and used often without the slightest attempt being made to "season" it. An American architect had in-

* See p. 516, *ante*.

formed him that in America, where building operations were carried on very rapidly, all timber, before being used, was placed for about three weeks in a hot room having a temperature of about 200°, and it would not do to use timber which had not passed through this ordeal, owing to the great extremes of temperature which characterised that climate. To a slight extent this precaution was adopted in this country, it being the practice of some builders to place their timber in the boiler-house, where it was subjected to a temperature of perhaps 90°. In answer to a question, Mr. Spiers said the timber was dried in America after being sawn, and not in the balk.

Mr. W. F. Potter said he thoroughly concurred with Mr. Mathews as to the great importance of having dry basements, but it was sometimes difficult to obtain them. Of course, when a gentleman was building a house for himself he was very particular on this point; but in building cottages or houses for his tenantry or workpeople the concrete footings, &c., which alone would effectually ensure dry basements, were generally the first thing to be sacrificed if the estimates had to be cut down. Difficulty was sometimes experienced by architects in obtaining dry areas to houses, although if the engineer were able to build a dry dock large enough to berth a ship in, it would not be creditable to the architect if he could not construct what might be considered a miniature dry dock in which to build a house. One point worthy of attention was that by building on concrete footings, and by spreading a layer of concrete a few inches thick all over the site of a house, rats, mice, black-beetles, and other vermin would find no lodgment in the basement.

Mr. H. H. Stannus thought that such practical papers and discussions as the present could not be too highly valued. Mr. Marnock, in speaking of electric or pneumatic bells, seemed to be under the impression that such bells were necessarily only provided with one gong. That was not the case, for as many bells could be used as there were notes in the chromatic scale. The fact was that it was merely a matter of economy to have only one gong to a number of communicators, and except in large houses one gong would generally be found amply sufficient. As to gas-pipes, they ought either to be always exposed to view, as was the case in Paris, or if concealed they ought to be carried up in "chases," in the same manner as soil-pipes, &c. As to the fibrous plaster ceiling slabs, there was no doubt that their use would effect a great saving of time, inasmuch as they could be made while the house was building, and screwed up directly they were wanted, and thus no time would be lost in waiting for plaster to dry. But, on the other hand, the joists would have to be made exceedingly smooth and true on their under surfaces if the slabs were to fit with anything like accuracy, and this fact, together with the necessity of concealing the joints of the slabs,—either by floating a thin coat of plaster over them or by covering them with bands or mouldings in relief,—would add considerably to the cost. In concluding his remarks, Mr. Stannus referred to the Museum of Building Appliances, adjoining the Architectural galleries in Conduit-street, as being replete with instruction to the architect and practical man, and it was only to be regretted that it was so small and so greatly overcrowded with models, &c. It was greatly to be desired that the museum, which was open free daily, should become better known to the public, who would gain much information from it as to what constituted good building.

Mr. S. F. Clarkson stated, with reference to bath-heating apparatus, that by placing the hot-water cistern against the kitchen range, with the flow and return pipes going direct from this cistern to the cold-water cistern, loss of heat through radiation would be reduced to a minimum. As to pugging for floors, whenever it was used some means should be contrived, if possible, for ventilating the joists. He thought that, in lieu of spindle-valves for cisterns, stop-cocks placed on the outside would answer more satisfactorily. Mr. Mathews had spoken, with reference to high-water pressure taps, of the difficulty of getting a tap which would at once shut off the supply. He thought that Tyler's "waste-not" tap was a very good thing. Where gas was used in large rooms, means should be provided, by means of a Carter's valve in an easily accessible position, to regulate the gas at will. A Carter's valve was best, because its leather could be renewed by merely unscrewing the upper diaphragm.

The President, in putting the vote of thanks to the meeting, said that such papers as that which had been read by Mr. Mathews were a sufficient vindication of the Association from the charge which was sometimes brought against it, viz., that it had forgotten its mission in the field of practical architectural education, and was "going in" too exclusively for art subjects.

Mr. J. Douglass Mathews, in replying on the discussion, said that there was no doubt that the use of slabs of fibrous plaster for ceilings would render it necessary that the joists should be more highly finished and more accurately laid than was generally the case, but he did not think that the additional expense would be very great. As to shrinking timber in the American fashion, at a temperature of 200°, he was afraid that its only effect in this country would be to cause the wood to warp and twist to an alarming degree. He cordially concurred with Mr. Stannus's remarks as to the Museum of Building Appliances.

NORTHUMBERLAND AVENUE, STRAND.

THE tenders for the building land here are to be sent to the Metropolitan Board of Works at the end of this week. Speculation is rife as to the rents that will be offered. We are bound to say that the system of letting by written tenders has never seemed to us a good one, and in many cases, we have no doubt, does not result in producing the largest rent obtainable. Those who would tender are entirely in the dark, and in the present instance we know of two public bodies who would gladly have given a large rent, and are absolutely deterred from making any offer under the course adopted.

INDIA "SPECIAL."

THIS rather vague and pointless title has been given to the collection of sketches taken by Mr. Simpson in connexion with the recent Indian visit of the Prince of Wales, and which are on view at the Burlington Gallery in Piccadilly. Of the sketches exhibited, 200 in number, about one-fourth were made for and have appeared in the pages of the *Illustrated London News*, but the remainder are new to the public, and the collection is worth a visit, both on account of the ability displayed in the sketches, hastily made as they necessarily must have been, and the interest of these representations, drawn almost on the spot, of scenes and incidents in connexion with a journey that has excited so much attention in England, and amid a country and people with whom many of us, though feeling so much connected with them politically, are practically unacquainted.

The majority of the sketches are tinted or shaded in Indian ink, with very slight foundation of pencil outline; one of the best methods of producing effect rapidly and without overmuch labour. The first on the list, the sketch of a group of dusky subjects waiting on the edge of the line of railway from Madura to Tuticorin, to see the Prince's train pass, strikes us as one of the best of the series; the character and action of the people,—the chubby little naked boys in the front of the line, the old, turbanned individual squatted near the foreground, the nice-looking woman standing by him, whose white drapery falls across her figure as picturesquely as that of some "classic" statue, are capital specimens of figures "hit off," as one says, with a slight and rapid touch. How far such sketches are really to be trusted as giving actual detail of grouping and expression,—how far the circumstances of the case render a little cooking up for the home market a necessity,—one cannot of course quite estimate. "Tiffin in the Jungle" (12), however, which is on a larger scale and more finished, shows that kind of distinction of manner as well as countenance in the figures which gives a realism to the whole, and makes them look like portraits. Some of the pencil studies, much more carefully made, of "native" heads, are very interesting, and bring vividly before us the wide distance between the character of these Orientals and the Europeans, with whom they have become so much connected. The artist has also shown, in spite of a good deal that is hasty, and sometimes apparently tentative, in the drawing of his elephants, a considerable power of realising the peculiar action of the various animals introduced in the sketches, as in the two elephants on the right of the drawing in "Crossing a Nullah in the Terai" (6), the "Buffalo Fight" at Baroda (22), where the straining action of the animal with his back to the spectator is very well given; the action of the tiger clinging to the elephant, and pawing wildly at the people in the howdah, in No. 34 (though surely the size of the elephant is exaggerated here), the fighting rhinoscerosses—or should one say *rhinoscerí*?—(29), which, by the way, would not fight, and which are fettered by a chain on the fore-feet in a way that does not seem likely to have left them much scope for a spirited engagement.

Among the most interesting of the drawings, in regard to subject, are the "Grand Chapter of the most excellent order of the Star of India" (39), presided over by the Prince and Lord Northbrook, where the former is placing the collar of the order round the neck of an Indian dignitary, "the Arrival of the Prince at Agra" (50), which gives a vivid notion of the Oriental splendour of the scene, in which the gorgeously-decorated elephants play an important part; the "Dinner in the Cave of Elephanta" (81), though we scarcely feel sure whether such an incident deserves the name of a "great historical event"; "The Prince witnessing the Fireworks in Bombay Harbour from on Board the *Mayfair*" (98), a capital sketch, in which both the figures and the effect of the fireworks are exceedingly well given; and the "Lama Dance before the Prince at Jummoo" (142), a place the exceedingly heathen-sounding name of which seems singularly appropriate for a festivity as grotesquely Pagan as could well be conceived, consisting of a wild and uncouth dance of people in fantastic dresses and masks representing the heads of elephants, bulls, and other animals. "It was understood," the catalogue note informs us, "that there was a symbolic meaning in the whole of this performance," but no one was present to explain it to the spectators. It is just possible that the explanation might not have been very edifying, either. "The Sacred Bull" is portrayed (103) as he walks mildly about the streets of Benares, and is ever and anon decorated with garlands from devotional passers by; and a less mild phase of animal life is shown in the sketch of "Elephant-fighting at Baroda" (97), which, however, is by no means so direful a piece of work as might be supposed, as it should seem that these big fellows fight merely by pushing against each other,—on the principle of "the ram," in fact; a sort of fighting which can only be impressive when there is such heavy metal on both sides. Among the few sketches in water-colour is a very good one of the interior of the Prince's tent in the camp at Delhi, and a very comfortable apartment it seems to make, with very little of the tent appearance left in it; and there is a very bold and not altogether unsuccessful attempt to represent the effect of the illuminations at Benares, January 5 (45), when the temples, palaces, and the broad flights of steps of the ghâts descending to the river, were all illuminated, and must have produced, in conjunction with the reflection from the water, a truly magnificent effect.

Architecture is not entirely overlooked by the "Special," in the midst of the more lively attractions of the tour; and his architectural sketches, mostly in colour, are very good. There is one of the rock-cut temple, now well known to most of our readers, at Ellora (90), called here "The Kaillas"; Mr. Fergusson spells it "Kylas." There is a very good sketch also, more finished than most, of the remarkable and elaborate front of a Buddhist temple at Ajanta (73), engraved on p. 125 of Fergusson's "Indian and Eastern Architecture," which we reviewed not long since. The interior of that unhappy specimen of builder's Gothic, the cathedral at Calcutta, receives illustration (130); and another drawing shows a curious specimen of architectural (if one may call it so) fancy, in the triumphal arch designed by Mr. Wise, and erected by the natives at Colombo, Ceylon, and which is formed by two great figures of elephants, constructed of a framework covered with leaves and branches, standing face to face on either side of the line of march, and with their trunks elevated, and meeting at the tips so as to form a pointed ogee arch. This is a new suggestion in triumphal arches, at any rate.

Looking over these numerous and able sketches, and comparing them with the equally-ably written accounts of the special correspondents of one or two of our leading journals, one cannot but reflect on the immense value of such attendance upon a semi-royal progress of this kind. But for the efforts of these gentlemen, wielding the pen of the ready writer and the

pencil of the ready draughtsman, the tour which has been followed with such interest by millions of people would have been a mere matter of hearsay, of no interest at all, except in any ultimate results, to those at home. As it is, between the pen and the pencil we almost follow the whole thing, and feel as if we had been there; the advantage of which is probably, at least, as great to those who are sketched and reported as to those who read and examine the reports and sketches.

A WORD FOR THE FUTURE OF EGYPT.

AT the last half-yearly meeting of the Anglo-Egyptian Banking Company (Limited), Mr. Charles Hill, F.S.A., recently elected a director, made a speech which was not only very interesting, but which evidently produced a feeling of reassurance. After some statements showing the manner in which the revenues of the country were increasing, and that Egypt, in his opinion, had been dealt hardly with by a portion of the English press, Mr. Hill said,—They have 1,100 miles of railway; they have greatly increased works of irrigation; and then they have a wonderful harbour in Alexandria, which will probably be one of the most flourishing ports of the world; 1,000,000 acres of land additional, which will come under cultivation; 300,000 acres partly under cultivation, affording a large area of taxation; 1,000,000*l.* expended in telegraphs; and throughout the country altogether there are elements of wonderful prosperity. Murray's Handbook speaks of Ismailia, which was a part of the desert, and the great founder of the Suez Canal put up a little hut there in 1861 or 1862. Then it was quite a desert; it is now described as a most flourishing and most luxurious place, having 3,000 resident inhabitants, and a constant influx of people from Cairo and other places as a cool sea-bathing place. That gives an indication of what Egypt can do. The land is bursting with a desire to produce, and it only wants irrigation to make that land productive in the highest degree. Well, there are all these advantages in favour of Egypt, and as your affairs are involved entirely in Egypt, you must see what possibility of improvement you have from this point. Now let me call your attention to the time when American securities, which are now 106, and thought to be one of the best securities going, were at the present price of Egyptian stock, and you will bear in mind what comments were made in the press on American securities at that time, and you will bear in mind the value of the remarks made on Egyptian securities now. American securities were decried in every possible way; they were driven away to Germany, and they have had the advantage of a rise from 40 and 50 to 100. The English people went into them with avidity at 80 and upwards. Do not let us despair because we are in a period of panic, but let us hope, on good foundation and facts, there is a future for Egypt consoling and satisfactory for those who hold Egyptian securities. I do not know that I need say any more, but, as I have studied the matter very much, I shall be happy to assure any one of the facts I have stated by pointing out to him the official documents that he may confirm this view. Now you see the injustice of a remark made: why should he embarrass himself with a 7 per cent. stock; if he had given a 3½ or 4 per cent. it might have done. What would be the justification of a man saying I will give 3½ per cent. when he could give 7? Recollect the wants of the poor bondholders. They have no friends in the Press whatever. I ask the gentlemen of the Press to look at both sides of the question, and consider how injurious their statements are to the bondholders. This bank issued one of the loans, and the distressing letters we have had are most sad, and the holders find no friends to stand by them. The comforts of a great number of English families have been increased by the investments in these securities over a period of ten or twelve years, and there has been no default till April, and they have been alarmed and frightened out of their bonds, nobody to stand by them or defend them. There have been some comments about the amount of stock issued, and the amount of money that has gone into the Treasury. I am going to state a thing which may probably surprise you, but I venture to affirm that more money has gone into the Egyptian Treasury in relation to the amount of stock issued than went into our Treasury during our exigencies when we borrowed money and raised stocks at various rates. In 1787 England created 25,000,000*l.* of stock, and the Government received 13,000,000*l.*; in 1798 they created 30,000,000*l.*, and received 15,000,000*l.* And so it goes on. In 1801 they created 44,000,000*l.*, and received 25,000,000*l.*, and comparing this with what the Khedive has received, you will not find there is very much to complain of. The rate of interest has been different, but the rate of interest in the two countries is naturally different. The country produces two or three crops, and where such is the case there is no ground to complain on that subject. The time will come, as soon as this panic is past, that this thing will be looked upon more dispassionately, and then I hope that you will have many friends to come round the Khedive and the Egyptian Government, and assure us that the revenue should be properly applied, and, the extraordinary expenses ceasing, there will not be the necessity for extraordinary loans or increase of expenditure, and there is a very fair prospect that the country will go on continually flourishing, and that the result in the end will be that every engagement will be properly kept. Mr. Cave says that no doubt the country has flourished under the Khedive, and I say, looking back, you have a right to believe that the honour of the man is well founded, and in the future will be as faithfully maintained as in the past.

NEW INFIRMARY BUILDINGS FOR THE ST. OLAVE'S UNION.

THE guardians of St. Olave's Union have had erected, from the designs and under the superintendence of Mr. H. Saxon Snell, a large block of buildings forming part of a new infirmary which, when completed, will provide for the reception of the whole of the sick inmates of their present workhouses. The portion now built will accommodate 172 inmates, but eventually there will be accommodation for 400.

The buildings, which are situated at the rear of the Rotherhithe Workhouse, Deptford Lower-road, and cover an extent of ground which, including airing yards, is somewhat less than 2 acres, have been recently opened.

The central block contains accommodation for all the administrative offices. On the left of the entrance court-yard is the doctor's residence, and on the right are the apartments of the steward, with his store-room adjoining. On either side of the entrance-hall is the medical officers' consulting-room and the waiting-room and matron's offices. The back portion of this central building contains the kitchen, 30 ft. long and 25 ft. wide, fitted with Messrs. Benham & Son's patent apparatus, which, besides being capable of cooking for the whole of the inmates, has sufficient boiler power to supply hot water and steam to the laundry, and also to the lavatories, baths, and sinks situated in various parts of the building. Besides this apparatus there is a kitchener, which will, however, only require to be used when the larger apparatus is not at work. The scullery adjoins the kitchen, and is fitted with washing-troughs, plate-racks, and shelves. The officers' mess-room is also contiguous to the kitchen, and on the opposite side of a corridor are six rooms of various sizes fitted up for the purposes of a buttery, larders, bread and root stores, &c. On the opposite side of the kitchen court-yard is a coal-store, and in the basement there is cellarage for wine, beer, and other like commodities. The upper portion of this central building is devoted, on the one side, to the matron's apartments, and on the other to dormitories for the nurses and other officers.

On entering the central building, and passing through the hall, there is a corridor 220 ft. long and 6 ft. wide leading right and left to the female and male sick wards respectively. The male sick wards are different from those of any that have heretofore been built in the metropolis, particularly so in the arrangements for ventilation. The plan of the building generally is in the shape of an elongated T. The central portion contains a well-staircase, with short corridors leading on each floor to two large sick wards situated on either side, and to a smaller detached ward for the reception of such cases as it may be desirable to keep in separation.

Adjoining the corridors are the nurses' rooms and ward sculleries, each of which has inspection windows overlooking the sick wards. Each of the larger wards contains accommodation for thirty-two beds, and is 96 ft. long, 24 ft. wide, and 13 ft. high, thus giving 72 ft. superficial and 936 cubic feet of space to each patient.

The construction of the windows of this ward is peculiar. They consist of a combined casement and hanging-sash arrangement. The lower part is a folding casement, and being carried down to within 6 in. of the floor, the folds when opened form a protection to the head of the patient from any rush of cold air passing into the room from the outside, and by this means, when the weather will permit, the wards may be kept well flushed with fresh air without inconvenience to the inmates.

For the ventilation of the upper part of the room, where the foulest air generally collects, it is sometimes desirable to open the top of the windows only, and in those designed by Mr. Snell this is provided for by a short upper sash hung on weights, as in ordinary windows. By the use of Smith's patent water bars, and the precaution of well grooving and tonguing the hanging and meeting styles of the casement, all fear of draught through the window when shut is thought to be prevented. The ventilation of the wards during the night, and at other times when the windows cannot advisedly be opened, is provided for by flues passing up the walls and emitting the fresh air into boxes placed under the head of each bed. These boxes have perforated zinc fronts through which the fresh air passes into the room and under the bed; and inasmuch as hot-water pipes are placed in these upright shafts, the fresh air is so rarefied that, on its entrance under the bed, it rises and in its course encircling, as it were, the upper part of the patient as he lays in bed, draws away from him the carbonic acid and other deleterious emanations of the body towards the ceiling, where there is over each bed an up-cast shaft for conveying away the fouled air from the ward. Each ward, besides being warmed by hot-water pipes, is provided with three open fire-stoves, and the flues of those placed at the end of the wards are so contrived that the brickwork surrounding them forms a screen to the door opening into the cross ventilated lobby that gives access to the water-closets attached to each ward.

Messrs. Croaker Brothers are the builders, and their contract, which amounts to 14,859*l.*, includes for the whole of the fittings, blinds, gas, and hot-water pipes and appliances of every description. Had the building been completed under the same contract the cost would have been about 60*l.* per bed.

The cooking apparatus and hot-water supply has been executed by Messrs. Benham & Sons. The gas-fittings and pipes were supplied by Messrs. Berry & Son, and the heating-pipes by Messrs. Potter & Sons. Mr. Butler is the clerk of works. The roads round the building were executed by Mr. Etheridge.

THE PUBLIC WORKS DEPARTMENT, INDIA.

COMPLAINTS reach us from several quarters of India. One engineer writes:—

Sir,—If promotion is to be no better than it is now in the P. W. D., and if no improvement is to be hoped for in the pension rules, it becomes a question whether it is worth the while of civil engineers to remain in the service. They will not forget that they are not tied down to this country; that they have a profession with which they can always earn bread and butter in many parts of the world. No climate and no conditions of life will be worse than they are to the majority of us here. If one could save money in India for the inevitable "rainy day," well and good; but if service here affords a mere livelihood, I argue that it is mere folly to remain in the country. Men fancy, or some men fancy, they are saving; but a sick wife, a short home furlough, or other little incidents of an Indian career, will very soon dissipate this delusion. No one can hope to really save money till he reaches the grade of a superintending engineer, first grade, and then he must be very slightly married indeed,—two children at most. Below this all saving is a sham; it is spent in going home, in sending children home, in going oneself, in the expense of payment transfers, and in fifty ways.

Compare the life here with life at home or in an English colony. There we have our wives, our bairns, always with us, healthy and happy. What so-called "Indian luxury" can make up for this? Is the huge darkened barn of an Indian house, with its mouldy thatch and ant-eaten floors, to be compared with the snug cottage of a temperate climate? Is the loathsome drive in the cheap buggy, or country-made barouche, drawn by a couple of horses that a cab-driver would not look at,—is this

luxury? Is this to be compared to the bracing walk in a bracing climate, with one's wife on one side, and the children round us, through the green fields? Are the food and drink here luxurious? Is there anything to compare with a decent beef-steak and glass of beer, with the ability to digest both of them? Ah! we are fooling away the best part of our lives in working for employers that have as much thought for us as our coolies. If we could really repay ourselves for this life of exposure and discomfort by making a few pounds for our old age, it would be reasonable; but we plod on here with no other hope than a short furlough, ending in a pension after thirty years' approved service, or, what is more likely, and pays Government better, death. I call on my brother engineers to ponder seriously on this question,—whether they are acting justly to themselves and their families in remaining in a country where nowadays there is nothing to be got, nothing to be saved, and, as we all know, much to lose. How many have lost wives, children, husbands,—and what for?—for a livelihood. I say a livelihood is to be got by any honest and hard-working man in fifty places where mere life is a pleasure. I shall be glad to see a little wholesome discussion on this point; and I doubt, when everything is summed up, whether any engineer in Government service is saving money, or is much better than a DECENT PAUPER.

A PARENT says,—

The Government engineers in India have not had very fair treatment. They give their past experience and their best years, and are bound down to their salaries, now so much reduced by the depreciation of the rupee; for they are not allowed, in any way, directly or indirectly, to add to their fixed income. Can you not say something for them? A word to the British public in your paper might do good. You can fancy what hard lines it is now for those who send money home, when it costs my son 2*l.* to send 10*l.* That wants no comment.

NOTES ON THE CONSTRUCTION OF PUBLIC AQUARIUMS.*

THE science of aquarium construction is still in its infancy, and has not advanced beyond the point of tentative experiment. So few such buildings have been erected on a large scale that we have to await the test of time and experience before we can with certainty say this or that arrangement is best suited to attain the desired end. In this short paper, then, the most instructive course which can be pursued will be to submit and explain a few plans of buildings already, or about to be, erected.

The plan of the aquarium at Hamburg shows a vaulted central hall, which the show-tanks on each side, lighted by a continuous skylight, and rooms at the end for table-tanks. The building is sunk to more than half its height underground, and appears to be admirably arranged, though on a small scale.

A very complete building has recently been erected for the Marquis of Bute at Rothesay. Entering through a spacious hall, 45 ft. by 28 ft., on either side are rooms for the table-tanks, each 26 ft. by 22 ft., with refreshment and retiring rooms adjoining. Leading from the hall is the aquarium corridor, 90 ft. 6 in. long by 15 ft. 6 in. wide, and having on both its sides tanks,—four for fresh and eleven for sea water. They have each a frontage of about 10 ft., and an average depth of about 9 ft. In the rear are the curator's room, work and pump room, and a probationary tank-room.

The Crystal Palace Aquarium, erected in 1871, has a corridor 250 ft. long by 20 ft. wide, having the show-tanks on either side, nineteen in number, varying from 25 ft. to 10 ft. frontage, and about 10 ft. in depth. All the tanks are for sea-water, but a large fresh-water tank is in course of construction at the north end. A notable peculiarity in the Crystal Palace Aquarium is the ambulatory running parallel with and at the rear of the show-tanks, in which are placed an equivalent number of tanks in reserve, which are used to contain surplus specimens, and also for storing the shrimps and other food for the fish. Light is admitted by a skylight running continuously the entire length of the tanks, the light before reaching the public corridor having to pass through the tanks. The sea water introduced in 1870 is still in use, and is preserved in good condition by being constantly kept in circulation, special means being adopted for its aëration. This system of a never-ceasing current has resulted in securing brilliancy of water and great healthiness of the fish, and attests the accuracy of Mr. Lloyd's views.* This reference to the Crystal Palace Aquarium concluded Mr. Norton's notes on aquariums already erected, and he next proceeded to describe several buildings either in course of erection or about to be erected, under the direction of himself and Mr. Philip E. Masey as joint architects. These embrace buildings for Weymouth, Clifton, Yarmouth, and Tynemouth.

Weymouth.—At Weymouth, the site is very circumscribed, and, whilst the Aquarium was of necessity to be the main feature, it was at the same time desired to combine the attractions of a music-hall and winter-garden. This latter feature is placed in the centre, and measures 200 ft. by 60 ft., laid out with flower-beds, aviaries, statuary, and fountain, allowing ample space for promenade. The enclosing walls are recessed to hold shallow table-tanks, &c., and support galleries for the orchestra and spectators. The whole is roofed with glass. External to this saloon are parallel corridors, 200 ft. long and 9ft. wide, forming ambulatories to view the eighteen show-tanks, which are respectively 39 ft. long in frontage by 13 ft. in depth, 19 ft. by 13 ft., and 20 ft. by 3 ft. 6 in. Reference to the Manchester plan shows the origin of this special arrangement, but with the notable variation that whereas there the walls which separate the corridors from the main hall are pierced with arches, throwing a confused light upon the fronts of the show-tanks, solid partition-walls have been adopted at Weymouth, and as the skylights extend only over the tanks, the corridors are in comparative darkness, and receive light only through the luminous water. The estimated cost of the building is 30,000*l.*

Clifton.—The building designed for Clifton shows the same main characteristics. The central hall and promenade measures 222 ft. by 60 ft. The chief variation consists in the continuity of the aquarium corridor or promenade, which surrounds the hall on its four sides, affording an ambulatory of nearly 600 ft. in length by 9 ft. in width. The show-tanks are lighted from the roof, and are twenty-nine in number, varying in frontage from 59 ft. to 19 ft. At the sides of the entrance-hall are the refreshment and retiring rooms, &c., and underneath the great hall a skating-rink is designed. This building is estimated to cost 25,000*l.*

Yarmouth.—The Yarmouth Aquarium is approaching completion. The site is at the north end of the Marine Parade, close to the Britannia Pier, and is one acre in extent. The great hall is 194 ft. by 60 ft., the nineteen show-tanks ranging the entire length of both sides. Fifteen of these are for sea water and four for fresh water. They have frontages of 50 ft., 33 ft., and 16 ft., and are mostly 15 ft. from front to back, though some are as shallow as 7 ft. and 5 ft. for special purposes. The water occupies a depth of 5 ft., and the bottoms of the tanks are 3 ft. 6 in. above floor-level. The reservoirs range underneath the tanks, from which they are separated by arches resting on iron girders, and both bottoms and sides of the reservoirs and tanks are lined with Val de Travers asphalte ¾-in. thick, well tucked into the joints of the brickwork, specially raked out to obtain a "key." The depth of water in the reservoirs is the same as in the tanks, viz., 5 ft., the proportion between the water in the store-tanks and that in the show-tanks being 1 to 1. These store-tanks or reservoirs are, of course, kept dark. The show-tanks on the west side receive light by a continuous skylight, 6 ft. wide; those on the east side are lighted by large windows, the sills of which are 6 in. above the water-line. In the centre of the hall will be the orchestra, and ranged between the iron columns will be placed table-tanks. These are of thick plate-glass, with enamelled slate tops, angles, and bottoms, and are made by Stirling. They are 3 ft. 6 in. diameter, 3 ft. 1 in. from the floor, and have a depth of 1 ft. 7 in. of water, giving a total height of 4 ft. 8 in. A seal-pond is sunk in the floor at the south end, and an alligator-pond at the north end, the latter heated artificially, and both measuring 17 ft. by 13 ft., with a depth of about 5 ft. of water. The narrowness of the site not allowing of the ambulatory and store-tanks being placed in the rear of show-tanks, as at the Crystal Palace, a light gallery running the entire length above the glass fronts of tanks allows the attendant access to feed the fish, &c. Space is gained at the ends for reserve tanks, as well as for rooms for the naturalist and his assistants. The entrance to the aquarium and future skating-rink is by two vestibules 18 ft. wide and 100 ft. in length. The rink will occupy the remainder of the ground to the south, and the restaurant that to the north. Underneath the north vestibule are placed two vertical boilers, two horizontal steam-engines, and three 4-in. rotary pumps, each capable of raising 8,000 gallons per hour; two other 3-in. rotary pumps, each capable of raising 5,000 gallons per hour, and two other pumps capable of raising 7,500 gallons per hour. These are supplied by Leete, Edwards, and Norman, and will secure a constant circulation all the year round between the store-reservoirs and the show-tanks, both sea and fresh water. They also lay on the water to the table-tanks and seal-pond, the pipes running in trenches under the asphalte and cement floor, which contain also the heating-pipes, an apparatus by Bacon & Co. being fixed in the engine-room in the basement. The steam closet and chest, gas roasters, lifts, &c., are supplied by Waller. It is intended to build a great music-hall over the aquarium, club and billiard rooms over the restaurant, and a glass winter-garden over the skating-rink. A temporary rink will be formed over the aquarium on the Portland cement surface which finishes Dennett's arched floor, and will afford about 20,000 square feet of area for skating. The contractors for this building are Messrs. Charles Aldin & Sons.

Tynemouth.—The Duke of Northumberland having granted, for a rental of 1*l.* per annum, some twelve acres of the cliff between Tynemouth and Cullercoats, the buildings are about to be commenced by Mr. Bergheim, at the contract price of 63,000*l.* The general arrangement of the great hall, relative position of tanks and reservoirs, and the proportion these bear to each other, are so similar to Yarmouth that it will only be necessary to state that the great floral and music hall will be 216 ft. by 50 ft. The aquarium will also be 216 ft. by 50 ft., containing tanks of varying depths and frontages, suitable for fresh and sea water fish, zoophytes, and sponges, in addition to which will be table and reserve tanks. The flanking buildings will be appropriated to entrances, refreshment and retiring rooms, and a smaller concert-hall. The baths in this scheme present a somewhat novel feature. They consist of ladies' and gentlemen's first and second class swimming-baths, private bath-rooms, and rooms for refreshment, engine, laundry, &c. The rink occupies a separate site on the upper level.

In conclusion, Mr. Norton said:—The noticeable distinction between the various plans I have submitted to you is the relative position of the show-tanks with respect to the ambulatory or spectators. At Westminster we see the evil effect of the tanks forming the sides of a top-lighted hall. At the Crystal Palace and Brighton the benefit of keeping the part devoted to spectators in comparative darkness is well shown. At Manchester the first suggestion was for an aisle, since actually developed in the designs for Weymouth and Clifton, where the nave is entirely cut off, and serves as a winter garden, the aisles forming the walks for spectators only deriving light through the plate-glass fronts, the water in the tanks being brilliantly illuminated.

The question as to the necessary proportion of water kept in the dark reservoirs, as compared with that in the show-tanks, is now being debated by those two eminent authorities, Mr. Lloyd and Mr. Saville Kent, the former gentleman insisting that it should never be less than 3 to 1. In actual practice at the Crystal Palace it is 5 to 1, and at Westminster 6 to 1, or 500,000 gallons to 100,000 gallons. Mr. Saville Kent, on the other hand, affirms that a proportion of 1 to 1 is all that is essential for success. Where such philosophers disagree it is difficult for us to decide; but, in practice, motives of economy, as a rule, determine the question, clients being unwilling to expend thousands of pounds in constructing underground cisterns when such an authority as Mr. Kent assures them that the reserve need not exceed the contents of the tanks themselves, which can thus economically be built, as at Yarmouth, in the space between the ground and the floor of the show-tanks. There is no necessity for sinking an aquarium underground, as at Boulogne and Hamburg. There is no need to

* From a paper read by Mr. John Norton before the Architectural Association on the 2nd inst.

* A full description of the Crystal Palace Aquarium, and of the means taken to aërate the water, will be found in the present volume of the *Builder*, pp. 212 and 243, *ante*; also in vol. xxxii (1874) p. 626.

change the sea-water; in fact, it is proved to be better suited to maintain healthy animal life now than when first imported, six years ago. The method of oxygenating the water by means of a constant flow and change has so completely taken the place of the old system of aërating by forcing air either from below or above, that in any buildings we are called upon to design it must be accepted as a *sine qud non*, and arrangements made for steam-engines, boilers, and steam pumps. A continual source of annoyance at the Crystal Palace, at Westminster, and other aquariums has been the frequent bursting or blowing out of the glass fronts of the tanks, which, though of the thickest plate, have been found unable to bear the great pressure of the water. It is be hoped that experiments will now be made to with the new toughened glass, which is said to resist five times the ordinary breaking strain, and by which the depth of water may be indefinitely increased without danger. The greatest care must be taken in fixing the glass to the iron frames or mullions and the stone heads and cills, so as to secure a perfectly even bed or surface, and minor precautions taken which time does not allow me to enter upon. It is better to adopt asphalte than cement for the inside coating of tanks and reservoirs, and no expense should be saved in getting the work done in the best possible manner. The tanks are furnished with rockwork composed of granite, Derby spar, or Portland spalls, varying in thickness from 10 in. to 3½ ft., put together with Portland cement. The back of the seal-ponds may be fitted with rustic rockeries, waterfall, ferns, palms, mosses, and creeping plants. As no aquarium in its present highly developed form is supposed to contain sufficient interest to secure permanent success, it is now considered necessary to supplement its attractions by subsidiary features, and hence the necessity to provide music and concert halls, winter gardens, skating-rink, club-rooms, restaurants, baths, and pleasure-grounds. The whole subject is well worthy the attentive study of the junior members of the profession, as the fashion is rapidly spreading from the mother country to the far East and West, in proof of which I may mention that we have been already consulted as to the construction of aquariums in Australia and in America.

AMONG THE RUINS OF IONA.

WHAT is being done at Iona? There is perhaps no more interesting spot out of Judea than this "island of the waves"—the very cradle of Christianity in Britain,—an island that abounds with priceless relics of antiquity, and contains, according to tradition, the tombs of scores of early kings, chieftains, warriors, statesmen, monks, and bards. Alluding to its famous architectural remains and sculptured memorials, Dr. Johnson uttered one of the most memorable of his sayings—"The man is little to be envied whose patriotism would not gain force upon the plains of Marathon, or whose piety would not grow warmer among the ruins of Iona." It may not be uninteresting to give some account of these ancient and sacred relics, and of what has been done, under the direction of the Duke of Argyll, the owner of the island, to preserve and enhance their appearance. Nearly all the foundations of the chapels and cloisters that were formerly heaps of rubbish by the fallen *débris* of the walls, and overgrown with grass, like so many green mounds, are now clearly defined, and built so as to present to the spectator a correct outline of the original plan of the abbey. The greater part of the labour has been bestowed on the north side of the cathedral, in restoring the chapel and refectory walls; the doorways and windows have been reconstructed in imitation of the style of the old architecture. The walls of the chancel have been strongly built, and to all appearance are quite capable of bearing a roof. A wall has also been built around the tomb in which St. Columba is said to have been buried. To the left of the entrance to the cathedral, on the Tow-Abbe, as the little hill in front is called where the saint is said to have uttered his remarkable prophecy, a square foundation is exposed, where once stood a cross. Outside the wall, and in front of this hill, another structure has been exposed. The excavations at the nunnery have been successful in bringing to view the lines of the foundations of that ruin also. The cloisters have been built a few feet high, the walls and gables have been repaired, and several of the windows restored. Among the numerous tombstones brought to light by the excavations is a very beautiful one, said to belong to the fourteenth century. The figures of two warriors in armour, and a galley, are sculptured upon it, besides other devices, and a Latin inscription not yet deciphered. It was found near the surface in the east aisle. If we are to believe the common tradition, it was in the year 560 that St. Columba, then forty-two years of age, crossed over from Ireland to Iona in a currach, or wicker boat, and, founding a monastic establishment, he set to work to convert the people. The monastery, it would appear, was destroyed about 250 years after the Saint's death by the invading Norwegians, who likewise killed all the monks. The Martyrs' Bay, a little to the south of the landing-place, commemorates the massacre. During the next four centuries the island remained unoccupied, but about the beginning of the thirteenth century a sisterhood of nuns, who followed the rule of St. Augustine, found their way to the island, and established a nunnery. About the same period some Cluniac monks, from Paisley, of the order of St. Bennet, landed at Iona, and erected the cathedral, which remains an object of veneration to the present day. The edifice, which is dedicated to St. Mary, is cruciform; its length is 160 ft., breadth 24 ft., transept 70 ft., and the choir 60 ft. It has a square tower, 70 ft. in height, supported by four arches adorned with figures in basso-relievo. The tower itself is extremely plain, but the tracery of the windows is very fine, and some of the ornamentation in different parts of the church or abbey is curious and beautiful. The capitals of the columns are of freestone, and carved with grotesque figures, still very sharp and well preserved. One of the capitals, for instance, under the tower, represents an ox about to be sacrificed. Two figures hold the ox, and behind is a priest chanting. Above is a dog coursing a hare. On the opposite column are two persons buying, with a pair of scales. Other columns represent the temptation of Adam and Eve; the fall of our first parents, and their approaching punishment; the Crucifixion, with the Virgin Mary seated, and an angel on either side; Peter cutting off Malchus's ear; an angel weighing a man's good deeds against his bad, while the devil is trying to get the balance of bad deeds down. Besides these quaint delineations, there are represented dragons with tails, ending in scrolls and foliage.

Much of this interesting work has been injured and mutilated by the barbarous acts of unprincipled relic-hunters. Since the Duke of Argyll appointed a guide to show visitors over the ruins these acts of vandalism have, happily, in a great measure ceased. The style of the whole is Early English, but the pillars and their decorations are the vestiges of an earlier era. On the north side of the chancel are the tomb and statue of Abbot Mackinnon (who died in 1500), with the head broken off. The same abbot's cross is in St. Oran's chapel, to be noticed presently. In the centre of the chancel stands the tomb of Macleod of Macleod, now the largest monument in the island. North and east of the cloister are the refectory and chapter-house, the latter a gloomy vaulted chamber, of which the roof is still entire. Over the chapter-house was the library, the repository at one time of a very valuable collection of books. In former years Iona was the place where the archives of Scotland, with many precious MSS. were kept, and it was in this library probably where these were deposited. At the Reformation most of the books, &c., were destroyed, though many of them, it is believed, were carried off to the Scottish College at Douay, in France. Of the principal altar of the cathedral,—the altar of St. Columba,—no vestige now remains. This shrine, which was 6 ft. by 4 ft., and built of marble, was entire so late as the year 1688, and is described by Pennant. By the side of the west entrance to the cathedral may be seen a granite cistern, which is said to have been used for the purpose of washing the pilgrims' feet, and in front of the edifice stands the celebrated cross of Iona, dedicated to St. Martin. This object is adorned with a profusion of Runic sculpture, and hewn out of a solid block of granite 14 ft. high.

Undoubtedly the most ancient and interesting of the ruins of the island is the chapel of St. Oran. The architecture of this small building (it is only 40 ft. by 20 ft.) is of the plainest description, its only decoration consisting of some chevron mouldings in the arch of the doorway, and a triple arch, which latter, however, has been added to the chapel since it was built. It is supposed to have been erected by the Norwegians in the twelfth century. The chapel contains several tombs of different dates, among others the supposed tombstone of St. Oran himself, whose fate, according to the chronicle, was very melancholy. A contemporary of St. Columba, St. Oran, we are told, was buried alive here to appease some fiend who undid in the night Columba's work of the day. After three days Oran was dug up, and immediately began assuring the bystanders that there was neither God nor the devil, future happiness nor punishment. Of course, such heterodox, not to say wicked doctrines, could not be tolerated, and Columba ordered the backsliding saint to be immediately re-interred. The transaction gave rise to a Gaelic proverb to the effect,—"Earth, earth on the mouth of Oran, that he may blab no more." The tourist has also pointed out to him here the effigy of a man in armour, the monument of Macquarie of Ulva, that of Angus Macdonnell, Lord of the Isles, which bears the carved representation of a galley, and the cross, or rather a portion of it, of the Abbot Mackinnon, under a canopied recess. Some of the traceried designs on these stones are characterised by considerable elegance and intricacy, considering the refractory nature of the material (mica slate) on which they are executed. The chapel of the nunnery, which has now been partially restored, is not without interest. It was built subsequently to that of St. Oran, and its architectural features belong to the Later Norman period, verging into those of the Early English style. The vaulted roof is constructed of very thin stones, bound together by four ribs, which meet in the centre. Here we see the monument of the last prioress, which is damaged by, as it appears, a portion of the roof falling. However, the inscription may still be read, and runs thus:—"*Hic jacet Domina Anna Donaldi Ferleti filii, quondam Prioressa de Iona, quæ obiit anno MDXLIII., tio ejus animan Altissimo Commendamus.*" The figure of the prioress is carved on the face of the stone, her head being supported by an angel on either side, and above is the representation of a looking-glass and a comb. The monument also bears the effigy of the Virgin Mary, over whose head are the sun and moon, signifying that she was Queen of Heaven. When Pennant visited Iona in 1772 he found this chapel doing duty as a cattle-shed, and this interesting memorial of the good prioress embedded several feet deep in dung! It is satisfactory to know that it is now being better cared for.

Leaving the nuns' chapel, we pass along a paved roadway called "Straidh na Marbh" (the Street of the Dead), and reach Reliq Oran, the burial-place of St. Oran, the consecrated spot where

> "The mighty kings of three fair realms are laid."

The Royal Cemetery, a portion of which is railed in, adjoins the chapel of the saint mentioned. Here, as Robert Chambers remarks, are gathered together "perhaps the most extensive holy alliance or congress of European sovereigns on the other side of the grave." We fear, however, that little can be pronounced with certainty in regard to Reliq Oran. The accounts handed down to us do not tally with sufficient historical accuracy. The tombs have been a good deal disturbed, and then it is probable that some of them have disappeared altogether. Certainly the existing remains are very considerably defaced as well as effaced. The kings, it is recorded, were buried in three separate tombs in the form of small chapels. The first contained the ashes of forty-eight Scottish monarchs, from Fergus II. to Macbeth. It was called Tumulus Regum Scotiæ. The second was inscribed "Tumulus Regum Hiberniæ," and contained the remains of four Irish kings; and the third chapel, the resting-place of eight Norwegian kings, was known as Tumulus Regum Norwegiæ. But discrepancies exist as to the exact number of these monarchs. One writer says forty of Scotland's rulers, another limits those of Norway to five, while another adds one king of France to the list. The sanctuary of the Norwegian sovereigns appears to have been shared by the lords of the Isles,—the M'Leans of Mull, the Macquarries of Ulva, and others. The tombstones are disposed of in nine rows, the third being the ridge of the kings, containing the royal personages aforesaid; the fifth comprises the priors of Iona; in the sixth is the ancient Clach-a-Brath, or hollow stone basin, containing several others, which it was the custom of pilgrims to walk thrice round, according to the course of the sun; the seventh row is the resting-place of the McLeans, the chief of Coll's tomb being

the handsomest of all. A green mound is pointed out near the Bay of Martyrs, whereon the bier was wont to be placed or rested while the mourners formed procession; the coronach or wail for the departed was then raised, and the coffin was borne through the street of the dead to its long home in the Reliq Oran. Almost every family of distinction in the Western Highlands had at one time, it is believed, a burying-place in Iona, and each grave had its distinctive cross. But out of 360 crosses which once adorned the island, two only are left, if we except the pediments of two more. The cross of Iona we have already alluded to. On the west side of Martyr-street stands M'Lean's cross,—a beautifully carved pillar, well preserved. The remainder of these relics were sacrificed at the Reformation by a sweeping edict of the Synod of Argyll. A large number were thrown into the sea, and many more were transported to other places. At Inverary, Campbeltown, and Dunstaffnage, for example, may be seen sculptured stones of Iona which may have covered great lords of the Isles, and have been carried off, that humble chiefs of the mainland might repose under them. That Iona should have become the favourite place of sepulture in which so many kings, princes, and lords were so ambitious to rest, may be readily accounted for. For one thing, there was the peculiarly sacred character of the island; but the desire was due more immediately, perhaps, to the traditionary belief that Columba's isle was to be particularly favoured at the dissolution of the world. It was founded on an ancient Gaelic prophecy, of which the following is a translation:—

"Seven years before that awful day
When time shall be no more,
A watery deluge will o'ersweep
Hibernia's mossy shore.

The green-clad Isla, too, shall sink,
While with the great and good
Columba's happy isle will rear
Her towers above the flood."

In a second poetic prophecy St. Columba is said to have foretold the destiny of his retreat:—

"Oh, sacred dome, and my beloved abode,
Whose walls now echo to the praise of God,
The time shall come when lauding monks shall cease,
And lowing herds here occupy their place;
But better ages shall hereafter come,
And praise re-echo in this sacred dome."

This prophecy has been to some extent fulfilled. The time did come when monks ceased to say their prayers and tell their beads in Iona, and only lowing herds occupied their place for many a day. For have we not seen that the religious edifices of the place were literally turned into barns and cow-sheds? Although as yet praise does not re-echo in the sacred dome, the primitive inhabitants of the island (numbering about 500) have for years had a modern Established Church, as well as a Free Church, in their midst, and who knows that the concluding part of Columba's prophecy may not one day be fulfilled also, now that something has been done towards the restoration of Iona's ancient architectural remains?

RAILWAY EXHIBITION.

On "Derby day" an exhibition was opened at the Crystal Palace of so-called "railway appliances," or objects connected nearly or remotely with railways and railway working. A good many objects were shown that could scarcely be said to relate to either.

The exhibition was arranged in the nave between the transept and the crystal fountain. The first objects presented were two powerful railway weighing-machines, one fixed, the other portable, by Messrs. H. Pooley & Son. Next in order was a hut roofed and walled with the patent concrete slabs of Mr. W. H. Lascelles, the capabilities of which have been recently noticed in the *Builder*, and do not, as adapted to cottage-building, call for further notice here. The erection was, however, in its proper place, inasmuch as attached to the hut was a short section of a cover for a railway platform, roofed, and the vallance formed, from the red tile-like slabs, showing the suitability of the material for this species of structure, as admitting of the erection rapidly, of a substantial station covering, at a small cost. A greater curiosity in the use of concrete was shown in the railway and tramway sleepers made of the same material. The railway sleepers had iron rods imbedded in the centre, not for the resistance of crushing, but of striking or hammering force. The strength of the material is very great, as had been proved by an octagonal block that was shown with the sleepers. It had been tested by hydraulic power with blocks of timber. Oak, with the fibre placed vertically, gave way at a pressure of between 180 and 200 tons, but the concrete block, under that pressure, remained uninjured. In durability, if in other respects it is suitable, the concrete sleeper would be superior to all others. For street and road tramways the concrete sleepers would probably be an improvement upon timber, provided that the rails can be properly fixed, and that the concrete would have power to resist the effect of concussions to which it would be subject. Its use would probably greatly diminish the injury and disturbance of the roads, and the inconvenience caused to other users of them, by the use of wooden sleepers. Mr. Lascelles's stall included also specimens of his patent sash-bars of cement, cast with an iron bar in the centre, and of his bent wood sash-bars. The one he recommends as being indestructible by the weather, and not requiring painting; the bent wood bars as combining maximum strength with minimum of material.

Among the novelties in railway appliances proper was an interesting working model of Sykes's patent lock and block electric signals, for which it is claimed that it would leave nothing to the memory of the men working the signals, and that it would make it impossible for more than one train to be in any one section of the line at the same time, as frequently occurs under the present block system. The construction appears simple, and easily adaptable to ordinary signal and point levers. In a recent railway accident the load of snow upon the semaphore bore it down from the horizontal, or danger position, to the slope, or "line clear." Mr. Sykes gives the semaphore-arm an upward slope for "line clear."

A beautiful working model was shown by Dr. Whyte, of Elgin, the inventor, illustrating his system of automatic electric signalling, by which the trains work the signals, blocking one section and opening another as they proceed. The model consisted of a circular railway fitted with semaphores, running and fixed contact plates, batteries, insulated wires, &c., and gives audible, as well as visible, signals with great precision as need may require. We noticed that every signal when at danger is guarded, and a bell is rung on the engine approaching, so that the signals are practically double; no signal can be unset by the passing train until another has been set, and a section is always kept clear by the arrangements adopted. The system is highly ingenious and complete, and has been tested successfully on a section of the Highland Railway. It may be feared that the delicacy of the apparatus and nicety of the arrangements will stand in the way of its general adoption. Dr. Whyte also exhibited an effective automatic brake.

A large working model was shown, illustrating the action of Mr. Attwood Brockelbank's patent coupling, that is regarded very favourably, we believe, by railway authorities, on account of its simplicity and the quickness and certainty of its automatic action.

The dangers attendant upon "fogging" are well known among railway men, especially on metropolitan lines, and Barry's apparatus, by which fog signals may be placed upon the metals without the signalman leaving his box, is well worth the attention of railway managers. In the Abbot's Ripton accident, it may be remembered, the signalman stated that he had not time to lay fog signals on the rails before the accident occurred. By the apparatus shown this would have been the work of only a few seconds.

Amongst exhibitors who may well dispense with any notice herein, their standing and reputation being enough to secure the respectful attention of the visitors, we may mention a few of many:—The London and North-Western Company, who sent five models of railway carriages, travelling post-offices, &c.; Mr. J. Cowdy, who furnished a fine galaxy of lamps; Messrs. Saxby & Farmer, signal engineers, who had an interesting stand; Messrs. Varley, who had an excellent display of telegraphic apparatus; Messrs. Banister & Annett, who showed a beautiful model illustrating their clever system of locking points and signals; Messrs. Reynolds's safety apparatus for the protection of points and signals; Mr. W. Inigo Jones's fine display of brass furniture for railway carriages; Hill's carriage window-holder, that is now getting to be generally and favourably known; Bristow's gas compressor; Wood's fine show of model engines; and divers others that we do not stop to name.

At or near the end of the range, towards the Hall of Kings, one of the most interesting collections in the Exhibition was to be seen in the assemblage of tools displayed by Selig, jun. & Co., represented by Mr. Neat. These were chiefly importations from America and the Continent of Europe, and included some remarkably clever tools and appliances. Those that attracted most attention were the hand-worked earth-borers, various in diameter; the belt-shipper, a simple and inexpensive contrivance, by which belts can be shifted whilst the machinery is in motion without the operator going near the riggers. This tool is, we hope, destined to come into general use until something simpler or more effective is brought out. On this stall also a machine for planing iron was shown, worked by hand, and taking work 8 in. by 4 in. It was shown at work, and performed well and quickly, quite distancing the progress that could be made by chipping or filing. The same firm showed, amongst a host of other tools, a hand-machine for boring wood to any angle, right or left, and another, double-action, for drilling iron to a variety of slopes and different bores. Tanite emery wheels were also shown, with other tools that we do not wait to enumerate.

The exhibits were not as numerous as they were last year; the exhibition, nevertheless, was of a most interesting character. Speaking for exhibitors who do not send attendants or guardians with their property, we should say that the Crystal Palace Company would do well to employ means to enforce the injunction, "Visitors are requested not to touch." With some visitors that we saw, a polite request was useless, whereas a sharp rap over the knuckles might have proved effective,—they deserved it.

CONGRESS OF FRENCH ARCHITECTS.

A CONGRESS of French Architects, under the presidency of M. Lesueur, will be held next week at the École de Beaux Arts, Paris, commencing, like that of their English brethren, on Monday, the 12th. Papers are to be read and places visited precisely as in our own case, and a confraternal dinner, at the "Grand Hotel," with *audition musicale*, will close the proceedings, on Saturday, the 17th.

Mr. Charles Lucas is the Secretary of the Congress Committee, at the meeting place of the Société Centrale des Architectes, 23, Quai de l'Horloge.

THE FRENCH INTERNATIONAL EXHIBITION OF 1878.

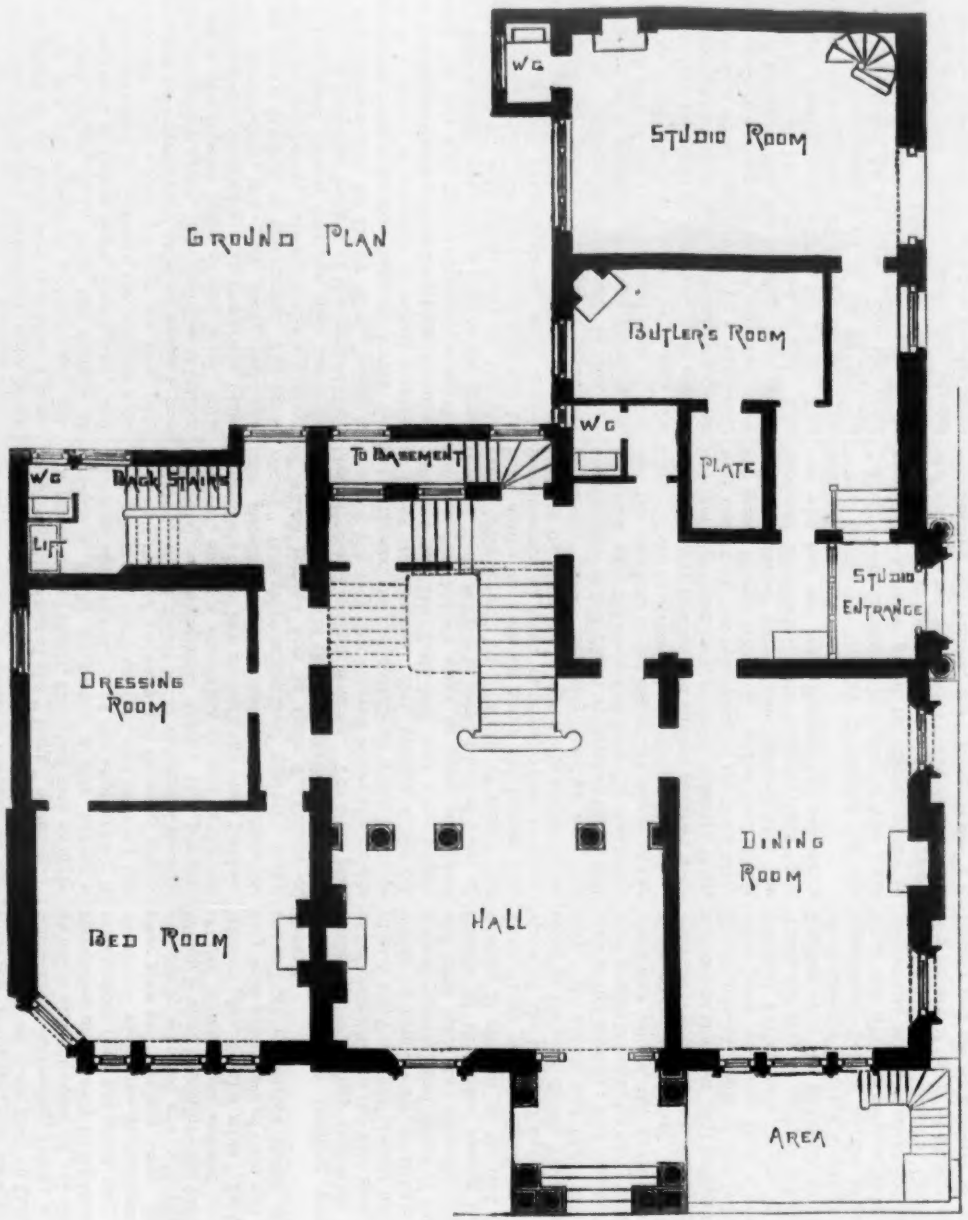
THE Commission appointed to examine and report upon the ninety-four designs submitted for the Exhibition building, have made their report. For reasons given, the Commission decline awarding a first premium. They consider that if it be desirable to utilise the ideas to be found in certain designs, it is just to acknowledge publicly the merits of their authors. Accordingly they recommend to the Minister to award a premium of 3,000f. (120*l.*) to each of the following six competitors, classed in the order of their hanging:—38, MM. Davioud et Bourdais; 69, M. Bruneau; 73, M. Crépinet; 80, M. Coquart; 89, M. Picq; and 93, M. Roux.

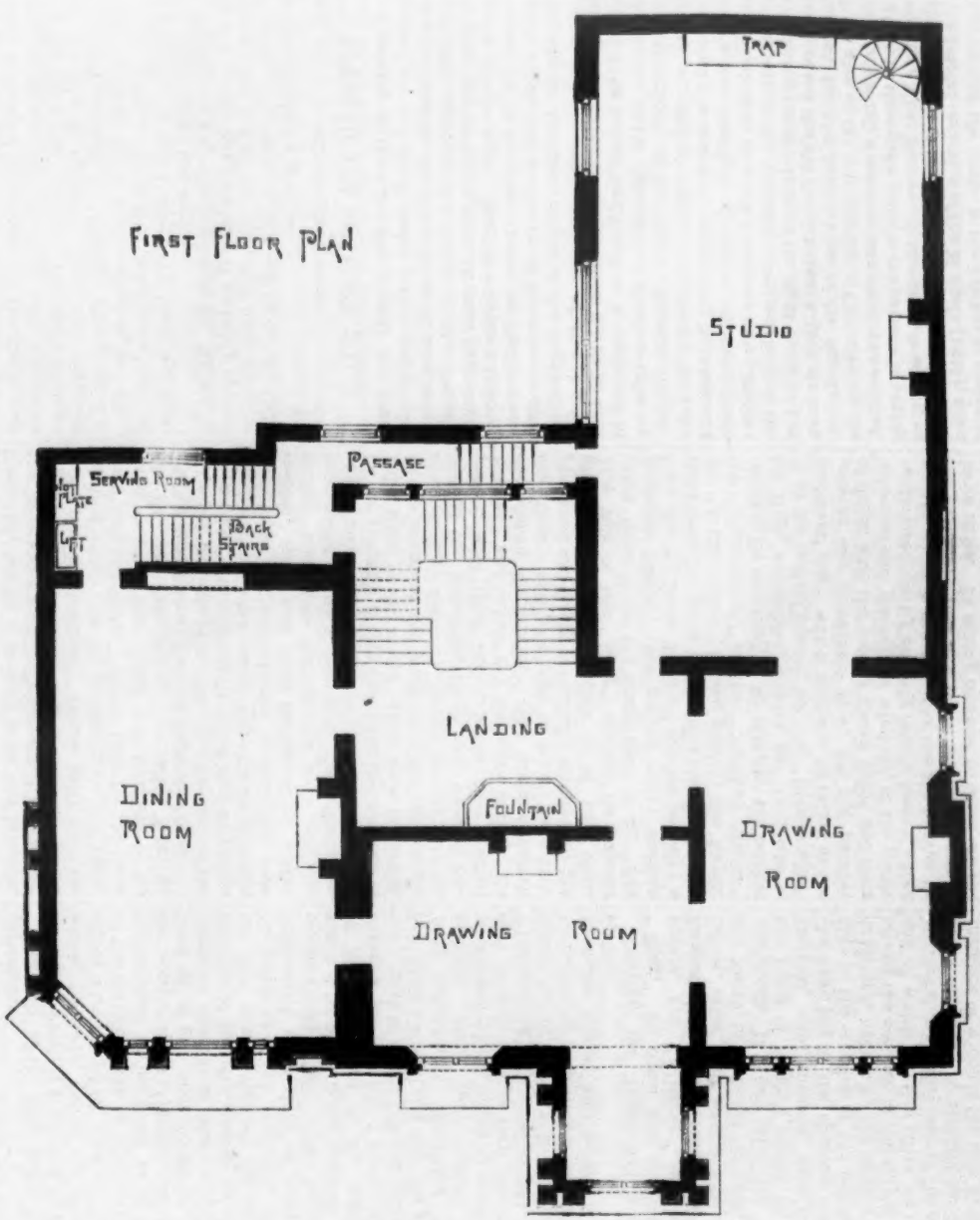
Considering that there are others which, by reason of certain points of detail, merit attention, they further recommend that a premium of 1,000f. (40*l.*) be given to the following:—42, M. de Baudot; 55, M. Simil; 60, M. Eiffel; 67, M. Raulin; 68, M. Huè; and 81, M. Flon.

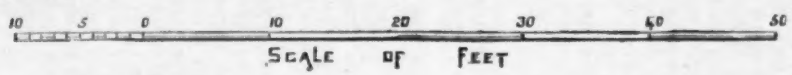
Lightning Conductors.—At the Science Conference at South Kensington on the 30th ult., Dr. Mann described the lightning-rods and apparatus for protection from lightning exhibited in the collection. He showed the relative values of copper and iron, the unimportance of their form, whether ropes, rods, or pipes, so that they are of sufficient size, and the need for domination of buildings by abundance of good points; but, above all things, he insisted on the indispensable importance of large earth contacts, and as to how these may be secured. A lightning discharge passing through an ample rod with large earth contact is a gentle stream, with low tension and no erratic and disruptive tendency. With small earth contact the discharge passes through the rod with high tension, and a most dangerous tendency to find other lateral passages of discharge for itself, and through bodies standing near the rod.

THE TOWN HALL OF BRESLAU, IN SILESIA.

NEW HOUSE AND STUDIO FOR MR. J. E. MILLAIS, R.A., PALACE GATE, KENSINGTON.]
MR. HARDWICK, ARCHITECT.







RESIDENCE AND STUDIO, PALACE GATE, KENSINGTON.

HOUSE AND STUDIO FOR MR. J. E. MILLAIS, R.A., KENSINGTON.

SOME short time ago particulars were given in our pages of the house now in course of erection for our distinguished countryman, Mr. J. Everett Millais, R.A., from the designs of Mr. Hardwick, at Palace Gate, Kensington,* and we then promised to illustrate the account with a view and plans. This promise we now perform, and for convenience' sake we repeat a few of the particulars given. The building is Italian in style, the façades being of red brick, with Portland-stone dressings. It comprises basement, ground-floor, one-pair floor, and two floors above devoted to bed-rooms. The basement includes kitchen, larders, butler's pantry, and the usual offices, together with servants' rooms. A principal feature of the ground-floor is the entrance-hall, 29 ft. by 26 ft., which is approached from a porch. Running across the hall is a screen of columns of veined marble. The floor is paved with coloured marbles. Running round the hall and up the staircase, along the first-floor landing, and then as high as the great staircase-window, will be a dado of Carrara and veined marble. On the ground-floor will be a bedroom and dressing-room, with conveniences; private sitting-rooms, a room beneath the studio for models, storage of canvasses, and so on. Access to this room is obtained by means of a separate entrance provided on the south side of the building, and once in this room the studio above is reached by means of a circular iron staircase in the south-east corner. The principal staircase is of Portland-stone, with wrought-iron scroll surmounted by a hand-rail. The first-floor landing will have a fountain. The suite of rooms on this, the principal floor, represents a length of 145 ft. from end to end. The principal drawing-room is 29 ft. by 18 ft. The smaller drawing-room, 26 ft. by 18 ft. The principal dining-room is 35 ft. by 22 ft. All these rooms are 15 ft. high. But the chief apartment on the first-floor is the studio, 50 ft. by 29 ft., and 24 ft. high; with large doors opening into the drawing-rooms for special occasions. The studio is lighted in the day-time by three windows, two on the north and one on the south. The walls have a dado in wainscot oak, and from this pilasters are carried up at intervals to the cornice. All the rooms, including the studio, have open fire-places, but the studio and dining-room are also provided with hot-water coils for use in cold weather. The floors throughout are Fox & Barrett's iron and concrete fireproof construction. Foreign cherry-wood is largely used for doors, window-frames, and other joinery. Messrs. Cubitt & Co. are the contractors. Messrs. Welton and Denny have been the foremen in charge of the works.

We express a cordial hope that Mr. Millais, in his new home, to which he will probably remove towards the end of the year, will long continue to adorn the profession in which he rightly holds so distinguished a position.

BRESLAU AND ITS TOWN HALL.

BRESLAU, on the Oder, the capital and great central point of the Prussian province of Silesia, ranking third as regards number of inhabitants (220,000) amongst the cities of the German Empire, was already a town of some importance in the Middle Ages. Tradition traces its history back to 900 A.D., when it was, as Berlin somewhat later, only a cluster of fishermen's huts. Speculation has been rife as to the origin of its name, but the most probable of the theories advanced is that it is derived from the Sclav *brod slava*, "the Sclavs' ford," and it is explained in this way. On the right bank of the river Oder lay the strongholds of the Poles (Breslau, Glogau, Brieg), erected of wood; the country between them and the mountains separating Bohemia and Silesia was the fighting ground on which Poles and Bohemians strove for mastery and plunder; the former, when worsted, withdrew behind the protecting river. It is on the right bank of the river, round the old Polish bulwark, that we have to look for the first traces of its foundation. Here also, at the introduction of Christianity, the first cathedral, a wooden structure, was erected, which in time gave place to the present imposing edifice. The Breslau of our time, however, on the left bank of the Oder, dates from the time of the fearful incursion of the Mongols (1241), when the part of the town on the left bank, protected merely by wooden walls, constructed of palisading with earth rammed in between, fell a prey to the flames, kindled, probably, not by the Mongol hordes, but by the inhabitants themselves, who withdrew to the other bank of the river, under the protecting walls of the "Burg," or castle.

Breslau, consequently, though of such an early foundation, is by no means a city having a Mediæval appearance. Any one approaching it by rail from the north or west, and noticing the numerous lines of railways and its many manufactories, would think he is entering a modern industrial or commercial town; this picture, however, changes somewhat as soon as the cab or omnibus takes him through the more fashionable streets of the so-called "Geheimrathsviertel" (the privy councillors' quarter), many of which remind him in their dimensions of Berlin. This part of the city affords some of the best aspects of modern Breslau. The older portions of the city are entered where the streets get narrower, the great traffic of which becomes at times troublesome. But, besides a few old churches and the Town-hall, and some courts and interiors hidden away in quiet nooks and corners, there is little to remind him of a city of the Middle Ages. The "tooth of time" has been active in clearing away the traces, but, notwithstanding these changes, there is something in the old many-steepled city reminding us of former times. Anybody familiar with the architecture of old Polish or German towns will be struck with the correct rectangular regularity and the spacious laying out of the centre of the city. These fundamental principles of the plan, with its many market and church squares, were laid down by those men, entirely unknown to us, who undertook the rebuilding of the town after the great Mongol irruption; and so well known and appreciated were those features that the Emperor Friedrich I. once declared that "any one who had not seen Breslau had not seen a handsome town."

The centre of Breslau is formed by the "Ring,"—which consists in reality of four great squares,—a name given to market-places in Silesia, much to the confusion of the uninitiated, and not to be associated with the circle of streets surrounding old Vienna, the "Ringstrasse"; it is merely the Germanised *rynck* of the Poles, which means "market." A great square of houses, with many parallel passages, united in the centre of this ring, besides the "Rathhaus," or town-hall, begun a century after the invasion, and by degrees artistically decorated, everything required for commerce,—the "Tuchhaus" (cloth hall), the "Reichkram" (trade hall), &c. On the spot where now the present town-hall rises, the "Leinwandhaus" (linen hall) for the linen trade, once so flourishing in Silesia, and by its side the "Schmetterhaus," so called from an inferior description of woven stuffs sold in it.

On the western side of the great square of the Ring (the "Paradeplatz") stood the weighing-office, with the town scales. Here the bales, worth millions, of the world-famed wool-market were stapled, and round them fluctuated an active traffic. Here also tournaments were held, and processions passed in honour of high personages, or judgment was pronounced; as that bloody one by the Emperor Sigismund, after the rebellion of 1418, when twenty-three rebels were beheaded. In the houses of the west front, the party-walls of which have been cut through for this purpose, resided the Bohemian kings and German emperors, with their suites, when they visited Breslau; and to this day the name of one, "Zu den sieben Kurfürsten" (the seven electors), the exterior wall paintings of which have been preserved and lately artistically restored by the present proprietor, reminds us of that time. This side of the "Ring" derives its popular name from it, or the house next to it, "Zur goldenen Sonne" (the golden sun); another from the "goldene Becher" (golden goblet); a third from the great pump once standing there, the "grüne Röhre" (green pump); the fourth, the "Naschmarkt," or the "Naschmarktseite" (market for dainties), is to this day the market for fruit, vegetables, flowers, &c. Opposite to it, in the central square, lies the "Riemerzeile" (saddlers' row), which ought to be called at the present day Jewellers' Row, for the number of shops, with the stories above them, and their balconies and plate-glass windows, of the partly modernised, partly entirely rebuilt houses, afford a sight which is not put into the shade even by the Frankfurt Zeil and other inviting marts of large cities. In strong contrast to these are the booths, reminding us of old Breslau, an institution peculiar to Silesian towns, by which trade and industry utilised the space otherwise cramped by restricting town-walls. Here, also, they still surround, in different shapes and sizes, on two sides the Town-hall, and here they stand, more safely than on their feet, on their old right and continually-increasing value; a fund for the abolition and purchase of the obnoxious booths succeeding only slowly to lay them low. Modern architecture does not agree very well with such checkered varieties; it requires everywhere a clear view and straight lines. Consequently an artistically-schooled eye will put the question, Which is more beautiful—the baroque structures of the Middle Ages, strewed about apparently without plan, or the wide "Paradeplatz," filled only with sober rows of cabs, and decorated with the solitary equestrian statue of Frederick the Great?

The interesting building commanding this latter square, though somewhat too small and out of proportion to the vast space on which it is placed, the Town-hall already mentioned, and of which we give a view, contains in its interior the council-chamber and offices of the town council, and over them the valuable city library. The interior of this jewel among the buildings of Breslau is entered on its east front by broad fliers, where we are faced by the symbols in stone of the juridical authority formerly exercised by the city, dating from the fifteenth century,—the beadle and the "outrider," a horseman in full armour; and opposite to them, on a high Gothic column, formerly serving as flogging-place and pillory, the executioner, with his instruments of punishment. Over broad stairs the spacious vestibule is entered, where the Mediæval number of the year 1481 strikes the eye at once. The foundation-walls of the building and some other parts are more than a century older, the building having been begun in 1330; and the Town-hall may be said not to have been properly finished until the sixteenth century, though its characteristic features, the richness of its ornamentation, belong to the preceding century. Thus the whole structure, although the archæologist may detect traces of budding Renaissance, is a creation in a beautiful Gothic style. There is a variety of oriels, of turrets, of ever-changing forms; and yet we perceive at once in the three gables of the principal front, through which we entered, the simplicity of the ground plan, a treble nave; but not carried out to the other side for the sake of convenience and local requirements.

The hall of the first story, 85 ft. long, the ceiling of which is supported by five pillars, and which, formerly, before the present municipal offices were parted off, took up the whole width of the building, was as often the scene of noisy assemblages of burghers as of the sittings of the ancient courts of justice,—of earnest deliberations as of gay civic festivities. Here the old patrician families as often stoutly defended the liberties of the city, almost as great as those of the free towns, resisted the encroachments of the guilds as of the emperors, and successfully maintained their right of keeping their own troops within the city, which, happily for Breslau, saved it from the many miseries which the rest of Silesia suffered in the many wars which ravaged it. In the "Fürstensaal" (princes' hall), next to it, the Silesian princes and estates held their sittings, and here the young Prussian King received, on November 7, 1741, their homage. Many more historic scenes, which were enacted here, might be recalled, but we have said enough. Let us step into the cool vaulted "Rathskeller" (council cellar), or "Schweidnitzer Keller," where to the present day the beer-desiring multitude is sometimes so great as to make ingress and egress a feat of some agility.

Leaving the Town-hall and the greater "Ring," we come into another large market square, the "Salzring" (salt-market), where formerly Russian caravans rested, bringing salt, tallow, skins, and similar products of the East and North, in exchange for cloth, linen, and colonial goods. It is now called the "Blücherplatz," the home of Rauch's statue of the great field-marshal, who, however, does not turn towards the west, but in the opposite direction,—a mistake in the erection of the monument not easily explained, except by the fatality which seems to attend the erection of statuary in all great cities, and of which Breslau offers no exception. The Mediæval-gable character of the square is already much disturbed by straight-lined structures, an instance of which is the new Exchange, a stately erection by Langhans, but which has become already the "old" one.

Symmetrically with this square, not insig-

* See p. 372, *ante*.

nificant in its dimensions, the "Ring" opens on to another of the same size, in the centre of which stands the Elisabethkirche, the principal Evangelical church of the city, an original Gothic structure of red brick, over which towers its steeple (289 ft. high), of which it has been said,—

"Majestically rises from the dust below
Its towering mass towards heaven."

Its former ornament, the high, but badly-constructed, leaden broach, was thrown down by a storm in 1529. Angels guarded its downfall, as an old sculpture below in the side of the tower testifies, and "only a cat" was killed by it. The present top, of copper, green with age, decorated with golden knobs, is more wonderful than handsome.

Passing the Elisabeth-Gymnasium, the Stadtbuchdruckerei (the town printing-office, dating back almost to the invention of printing), now Grass, Barth, & Co.'s, we come, through a narrow lane, to a spot where three market-places may be overlooked,—the "Ring," the "Salzring," and the "Neumarkt." The latter, a large square, has most preserved the type of the narrow gabled house and the pointed roof; and when the moonlight brings out its outlines sharply, its shades, however, less decisively and steadily, it offers, with its sombre, otherwise little beautiful row of booths on the one side, an aspect such as the artist's eye loves to see. In the mornings a bartering crowd fills its space, and many are the dialects of the Silesians who come here to sell their produce.

A fourth square, separated only by a short market street from the "Ring," is that on which stands the two-steepled "Magdalenenkirche," the second largest of the Evangelical churches, with its Gymnasium. An iron bridge, one of the many landmarks of Breslau, connects the two steeples at the top. On the south side of the church is a gateway which was brought here from the Convent of St. Vincent, erected in the twelfth century by the half mythical Peter Wlast, and destroyed in the fourteenth century for fear of the Turks, who, it was thought, might probably make use of it as an important position. It is a curious and artistic specimen of a semicircular arch, of which there are very few in Silesia, and not a second one in Breslau. All these buildings mentioned belong to the ground on which old Breslau stood. But there are no traces left of all that labyrinth of narrow turnings which in almost all old cities and towns of Germany lead the stranger astray and finally back to the spot he started from. Farther towards the north—where the imposing front of the university, with its observatory, is reflected in the surface of the Oder, here divided into two arms, and crossed by a handsome bridge of stone and iron, which took the place of the old Polish structure with wooden arches—begins a region of narrow and crooked lanes. This, however, is not the old building-ground of 1241; it is the spot where formerly stood three ducal castles along the Oder. Here also the Jesuits erected at the end of the seventeenth century their stately emporium, the remarkable aula of which, possessing excellent acoustic properties, as well as several large halls, are covered with a rich profusion of colour, stucco, and gilding displayed in luxurious rococo work, while the large exterior portals and window lattice-work, specimens of excellent wrought iron-work, are creations of a refined taste. The fighters for Papal supremacy have not been able to complete their gigantic project; their power was paralysed before they had even time to create a free space before the front turned towards the interior and its proud balconies, and the ugly row of old tumble-down houses still stands hugging the stately edifice.

Towards the south old Breslau was surrounded in a wide circle by a wall rich in turrets, of which traces may still be discovered by the local archæologist. With the pulling down of the old town wall in the fourteenth century, the city entered a new historical period, and by degrees lost its former semi-independence by being incorporated with the Crown of Bohemia. But during that time the city, by the care of its princes, increased wonderfully, and its fortifications were pushed further southwards in a still more sweeping circle. We pass over the period which followed, until, under Frederick the Great, the city was incorporated with Prussia; he caused it to be regularly fortified according to Vauban's system. Those elaborate fortifications were, however, destroyed by the conquering French already in 1807, not, however, without great benefits arising from it. As in 1813 the great national movement of the War of Liberation poured forth from its gates, until in an overwhelming stream it drove the despoiler from German soil, so the pulling down of the restricting boundary infused new life into the city, and the possibility for the Breslau of the present day was created. Now a well-kept promenade leads along the former ramparts; the large "Exercierplatz," or drill-ground, spreads out in front of the Royal Castle, rebuilt by Frederick William IV., bounded on one side by the new Exchange, built by Lüdecke in Late Gothic style, the large block of the House of the Provincial Estates, in which, besides the provincial administration, the provincial archives, and the picture-gallery find a home, as well as by the new palace of the Royal Bank. On the other side we notice the new theatre, rebuilt, after being twice burnt down, also by Lüdecke; the Government House, built after designs by the same architect, in the Florentine style of the fifteenth century; and, towering over both, the highest church nave of Breslau, the "Minoritenkirche" of St. Dorothea, supported by slender pillars.

If we turn our eye to the west, we arrive, past the Byzantine dome of the new Synagogue, past the great red-brick building in Late Gothic style of the "Stadtgericht" (court of justice), and the great central prison and several barracks, to the three western railway termini and the many manufactories which we noticed on entering the city. In the broad belt stretching from these western termini towards the east, past the "Central-Bahnhof" (central terminus), the former glacis has in the course of decennials been changed first to large gardens with single villas and houses, and finally into long rows of streets; and this change still continues. It will not be long before those streets will stretch in all directions for miles from the centre of the city, the "Ring."

It has been held in Germany that cities spread most in a southerly direction. If this is the case with Breslau, it is the natural consequence of its first foundation, as well as of the fact that the river Oder, running along the whole northern side of the city, separates it from the suburbs on that bank, and only now, after numerous bridges are in course of construction, the country begins to be covered with buildings in that direction. But what draws us especially that way does not consist so much in the new erections; it is the fact that this is the region of the oldest part of Breslau, which was first colonised. Of the former ducal castle, there remains only the small Church of St. Martin, an architectural curiosity Close by, public institutions, such as the Asylums for the Deaf and Dumb and the Blind, orphan asylums, hospitals, the botanical gardens founded by Treviranus and Nees von Esenbeck, and improved by Göppert, on a site formerly part of the old fortifications, the University Library, and the Museum of Antiquities, cluster round it. But this is especially the region of churches, for here moves the essentially Catholic part of Breslau's population. The stately double row of the silent "Domherrenkurien" (chapter-houses of the prebends), with the bishop's palace and the modern clerical seminary, form the centre. The cathedral of St. John the Baptist, just renovated, its oldest parts dating from the middle of the thirteenth century, when Romanesque forms were here and there still used, is in its principal parts a structure of the most beautiful Gothic. Its exterior shows little that is attractive to the eye, but the painting and sculpture of its interior, and especially of some side chapels, present to us the splendour of different ages and styles. The most important production of art is a work of the Nürnberg carver, Peter Vischer, the epitaph of Bishop Johannes Roth, date 1496. The Church of St. Mary-on-the-Sands, in its interior, surprises us by the boldness and lightness of its vaulting, while its outside strikes us by its massiveness. Its tower, like the twin towers of the cathedral, has lost its former pyramidal steeple, and is covered in by a temporary roof; the only tower of Breslau of Mediæval times which shows a Gothic form is that of the "Kreuzkirche" (Church of the Cross), which enjoys besides the advantage of having preserved its original beauty. Having been erected over the Church of St. Bartholomew, a crypt such as is not found anywhere else of such a size, it is approached by flights. The most remarkable work which it contains is the tomb of its founder, Duke Henry IV., of Breslau, the Minne-singer (died 1290). But the two open-work pyramids in real Gothic style, towering over Breslau, belong to the present age; in the north-east that of the Catholic church of St. Michael, the design of which provided for two towers, the northern one, however, falling directly after being finished, and remaining a dwarfed creation; in the south-west, that of the Evangelical church of the Holy Trinity, a neat red brick building, belonging to the almshouse of the same name. There are two more Gothic towers in the course of erection, one of which will rise, in the south-east, over the Evangelical church of St. Salvator, almost completed; the other, in the south-west, over the Catholic church of St. Nicholas, just begun. The first three churches are replacing older places of worship removed for different reasons; the latter one destroyed as long ago as 1806 during the siege of the city.

If we take together in one view the panorama which we have just passed through, it will be seen that Breslau is a city which is developing itself in accordance with the requirements of modern life.

ANCIENT PERUVIAN RUINS.

AN American traveller has given in the *New York Times* an account of a visit recently made to the ancient Peruvian ruins which are situated at Pachacamac, a place about twenty miles distant from Lima. An hour before reaching the site of the ruins, massive walls stretching out over the sandy plateau gave assurance that the party had at length reached the object of its search. These ruins are usually thought to be those of a large city, but there seems to be more propriety in believing them to be the remains of a vast cemetery, to which the dead were brought from all parts of the surrounding country.

The ruins are situated on a sandy, barren plateau, destitute of any sort of vegetation, the lowest part of which is 100 ft. above the level of the surrounding country. The mass of the ruins is composed of structures, nearly square, measuring 25 ft. to 35 ft. on a side. These structures are generally simple undivided inclosures, although there are some which have been divided by interior walls into several smaller compartments, communicating with one another by doorways. The walls are from 6 ft. to 10 ft. in height, and are generally about 3 ft. in thickness. In spite of their being built of adobe, or sun-dried brick, these walls are generally in a good state of preservation: this is to be attributed to the infrequency of rainfalls and the total absence of frost in this region.

There are several reasons for supposing that these buildings were never used as dwelling-houses; for, although the buildings have doors, the lintels of which are made of split bamboo, they have no windows; nor have any traces of door-hinges and catches been discovered; nor are there any traces of fireplaces, which are an unfailing indication of human occupancy; nor have any remains of roofs been found; nor do the walls give any indication of having ever supported a roof-covering. But the best argument for supposing that these are the ruins of an ancient cemetery, and not of a city, is the number of graves which are found in the floors of all these so-called houses, and which in such a climate would have made houses whose floors were put to such a use absolutely untenable by the living. The small niche or niches—for several are often found in the same enclosure—found in each structure are supposed to have been the places where food and water were left for the spirits of the dead. There is, too, a large enclosure more than a quarter of an acre in extent, surrounded by walls 15 ft. high, but with no trace of a doorway or entrance of any kind. A rough entrance has, however, been broken through the walls by drovers, who use the enclosure as a cattle-pen on their way to Lima.

Besides these enclosures, there are several large rectangular mounds 40 ft. high, 60 ft. long, and 30 ft. wide, built solid of adobe brick. One of these had been opened in the search for hidden treasure; but the seekers, after having penetrated more than one-third of the depth, and having found no indication of either hidden chamber or tomb, had apparently abandoned the search. Upon the top of another mound were graves which had evidently been opened recently.

These various enclosures and mounds are distributed over a tract of over 400 acres; but, if all within the outer wall of the precinct is considered, more than 700 acres of ground are covered. It is a curious fact, that none of the buildings at Pachacamac are built of clay; the adobe walls are built of the alluvial soil found in the valley of the Lurin, just below the plateau. This observation applies equally to the huge ruins that are

found on the plain near Callao. But still more remarkable is it, that these vast ruins near Callao have had their interiors filled up with clay, which must have been brought from a distance, as there is none to be found in that neighbourhood, by a hostile race, for the purpose of destroying these temples of a conquered people with all possible degradation. (?) As clay is very scarce near Lima, some enterprising man has established a brick-kiln near these clay-stuffed ruins, and burns bricks for the Lima building-market.

The most interesting of the ruins is the large conical hill, which is usually called the Temple of the Sun, though the original inhabitants of Pachacamac, the Chimoos, were not worshippers of the sun, but of the god Pachacamac, who was considered the creator and ruler of the world. The worship of the sun was not introduced until the Chimoos were conquered by the Incas, about a century before the conquest of Peru by the Spaniards in 1533. This hill, the sides of which are covered with terraces, each about 50 ft. wide, is situated about half a mile from the seashore. It is about 700 ft. high, and its base must cover nearly thirty acres of ground. The terraces probably formed a winding and gradual ascent to the top of the hill, but have fallen into such decay that no continuous roadway now exists to the summit. The summit is nearly a rectangular space, perfectly level, of something more than an acre in area. No remains of the large stone building, which is said to have existed at the time of the visit of Hernando Pizarro, can now be seen. Some recent explorer, thinking that there must be an interior chamber somewhere in the hill, had dug a hole in the summit at its centre; but, after having sunk a hole about 20 ft. deep, he had reached the solid virgin rock, and had, of course, abandoned the search in that spot. He or some other explorer had made another cutting in the side of the hill; but, after penetrating the outer coating of adobe brick to a distance of about 45 ft., the virgin rock was again reached. This seems to show that this hill is simply a terraced natural hill, and not a creation of man, like the large stone pyramids which in Mexico were devoted to the worship of the sun.

PROPORTION IN THE FINE ARTS.

SOCIETY FOR ENCOURAGEMENT OF THE FINE ARTS.

ON Thursday evening, June 1st, Mr. Danby Seymour in the chair, Mr. Cave Thomas delivered a lecture on "Proportion in relation to the Fine Arts." He said that he had endeavoured to bring common sense and a more rigorous method of investigation to bear upon subjects connected with the fine arts. He had not the least doubt that the Greeks could have given sufficient reasons for the proportions they used, and that they obtained these by a scientific method. We, like children, take the Grecian canons upon trust, and will never be masters till we know the why and the wherefore certain proportions are beautiful, as, doubtless, the Greeks did.

Mr. Thomas then showed by an examination of the constitution of the senses, the sense of sight being that immediately belonging to the subject of the discourse, that man is a meter of quantity, and that all criticism is virtually an act of mental mensuration; our knowledge is fundamentally quantitative. The recognition of this truth crops up in criticism, which, in disapproval, is ever the reprobation of either the too little or the too much.

All our knowledge being fundamentally quantitative of proportional relations, the lecturer proceeded to inquire whether there was any well-attested and recognised metric principle of rectitude? The reply was in the affirmative. The metric principle of moderation which, from the universality of its application, had been enthroned and crowned as the golden mean. It was one of the most ancient of scientific principles which we possessed, and the lapse of time only brings fresh testimony to its truth. Observe the *mean* in all things is a principle that has not been discredited from the time of Thales to the present day, though like other great truths it is more frequently honoured in the breach than in the observance.

Mr. Thomas then showed the position of the *mean* in the unitary calculus, and also in the calculus of ratio, or limits of differentiation, an instrument which arrays before the eye the entire universe of quantitative relation, and proceeded to apply the principle of moderation to the selection of elementary geometrical figures, showing that the ratio 1 : 2 had always been approved in the oval, the parallelogram, the lozenge, &c., also the succession of ratios 1 : 2 : 3. From this he went on to prove that the *mean* was the measure of human beauty; quoted Reynolds and Hogarth in support of his argument; and then applied the method of averages to its determination, in the same way that the astronomer determines the true place of a star from a number of imperfect or erroneous observations. From form he transferred the principle to colour, and pointed out that (white) light is, according to received notions, a *mean* of all the prismatic colours; that the principle obtains in mitigating pigments and in linking these together, as Spenser has it, by "toned meanes"; that the very ethics of art are to steer between extremes, and preserve a *mean* or mid-course between opposite qualities, between hardness and softness, between roughness and smoothness, between looseness and formality in composition, &c.; that this was the principle the observance of which made Raffaelle so pre-eminent; and that even Michelangelo, in the very torrent, tempest, and as he might say, whirlwind of his design, begat *temperance*, which imitators missed and fell into most ridiculous excess. Shakspeare thoroughly understood this metric principle of moderation, and Mr. Thomas, by applying the poet's words to Michelangelo's design, showed how applicable they were to both arts. The lecturer built up his science of proportion, as he believes the Greeks possessed it, on the central principle that rectitude lies in the mean, and consequently beauty, for beauty is neither more nor less than perfect physical rectitude. He also showed that there are common harmonic principles underlying all the arts. The lecture will be published.

A NEW WORKHOUSE FOR CAMBERWELL.

THE present Camberwell Workhouse in Havill-street, Peckham-road, having for some time past been found too small for the requirements of the parish, the guardians have decided to carry out the wishes of the Local Government Board by erecting an entirely new workhouse on a new site adjoining Nazareth House, Peckham, which will not only be a much larger building than the present establishment, but will also be constructed on a much better principle than the building in Havill-street, which is in many respects inconvenient and unsuitable for its present purpose. In the discussion which took place on the subject at a meeting of the guardians which has just been held, some of the members strongly opposed the project, contending that the erection of two narrow wings and an additional story to the present building would provide for all reasonable requirements for several years to come, and instanced the fact of large spaces within the parish, formerly open fields, being now covered with houses and occupied by persons who were not likely to become paupers, showing that no great increase of pauperism in the district need be expected. It was urged, however, on the other hand, a very large proportion of those occupying these recently-built houses were composed of the needy classes, who had been driven from the more crowded parts of the metropolis, and had sought refuge in the outskirts, and that these were the class of people most likely to become paupers. The low class character of large numbers of dwellings recently erected in several districts in Peckham was cited in proof of the probability of pauperism increasing in the parish, and the yearly increasing difficulty of obtaining land around the metropolis was given as another reason why it was desirable at once to secure the erection of an entirely new building. The proposal to do so was affirmed by a large majority of the guardians. The estimated cost of the new building is about 45,000*l*.

NEW BUILDING ACT REQUIRED.

THE Medical Officer of Health for Whitechapel (Mr. Liddle) in his last report says:—

In this district alone, owing to the defects in the existing Building Act, several houses within the last fifteen or sixteen years have been built, which are, in my opinion, unfit for habitation. These have been pointed out by me not only to your Board, but to the Metropolitan Board of Works; but owing to the defective sanitary provisions of the Building Act, there was no power to prevent their erection. It appears now to be highly probable that in due course upwards of 450 houses will be taken down in this district on the south side of Royal Mint-street, and on the site a superior class of new houses for the accommodation of the working classes will, probably, be built; it is, therefore, of the utmost importance that a new Building Act should be speedily obtained, whereby the erection of unhealthy houses may be prevented; the said Act to contain sanitary provisions as regards the foundation and the prevention of the rise of damp in the walls; to further enact that all the rooms, staircases and passages, shall be properly lighted and ventilated,—that all the rooms shall have sufficient superficial space, and be not less than 8 ft. in height; that all the necessary conveniences shall be provided separately for each house, and that each house shall have an open space at its rear. It appears to be a waste of money to pull down unhealthy houses, and, at the same time, allow others alike unhealthy to be built, which, shortly after their erection, may be condemned as unfit for human habitation.

In building a new class of houses for the better accommodation of the working classes, it is in my opinion essentially necessary, as tending not only to promote their health but to improve their moral condition, that every room should be light,—that there should be no dark corners for the accumulation of dirt,—and that the houses should not exceed four stories in height; for, unless the streets were made proportionally wide, the higher the houses the greater will be the absence of sunlight, and thus interfere with the proper ventilation of the rooms. High houses on each side of narrow streets, in which little or no sunlight is admitted, are not healthy. It is true that the current of air is greater while passing between rows of high houses, but currents of air, without the accompanying heat of the sun's rays cannot be considered as proper ventilation. A current of air passing through a tunnel may, perhaps, by some persons, be considered as efficient ventilation; but I apprehend that few persons with any regard to their health would like to reside therein. I firmly believe that many persons who are compelled to occupy rooms in which the rays of the sun never enter soon lose their health, and find it necessary to change their residence; and this remark applies, although perhaps with less force, to those who are confined to counting-houses during the day, in which no sunlight is admitted.

Sunlight is especially necessary for the healthy existence of children; and this is strongly pointed out in the evidence of the late Mr. N. B. Ward (the inventor of the "Wardean Cases" for rearing plants in towns, and conveying them to and from distant places, a gentleman of great eminence in the medical profession; and who had given much attention to the influence of the temperature of air and light on the health and growth of animals and plants) who says, in his evidence before the Commissioners appointed for inquiry into the state of large towns and populous districts, that, as the result of his experience, the influence of light is a matter of the highest importance to the proper physical development of the human species; and whatever stints the growth of a child, certainly operates upon his physical capacity for labour; that the amount of disease among persons occupying light rooms is infinitely less as compared with that in dark ones; and that the influence of light, especially solar light, in preventing the fatal termination of disease, is a fact well known to him.

In further illustration of this subject, Mr. Ward quotes a fact stated on the authority of Sir James Wylie,—"that the cases of disease on the dark side of an extensive barrack at St. Petersburg have been uniformly, for many years, in the proportion of three to one to those on the side exposed to strong light."

TOOLS AND MEASURING INSTRUMENTS.

SIR JOSEPH WHITWORTH, in returning thanks last week for the freedom and livery of the Turners' Company, which had been presented to him, said forty-three years ago he gave his entire attention to the construction of engineers' tools, and for these he took out the first patent, including in it the lathe, the planing-machine, the screw-wheel cutting-machine, and the boring-machine. As he then constructed the lathe and the planing machine, so were they made now without any alteration whatever. In the lathe the guiding screw formed one of the most important parts, and he did what he could for its improvement. He got rid of fractional measurements and made the screw as perfect as possible. In the guiding

screw, 30 ft. long, there were two threads in the inch, and they worked upon it every day for six months, making it take out its own errors, and that had remained ever since as their standard. Making a perfect screw was one, perhaps, of the most important as well as one of the nicest applications of mechanism. It took a long time to do it, and until he was able to measure with such accuracy there were no means except by the sense of touch of knowing when they had a screw that was absolutely correct. It was of great importance to the mechanical arts generally to have bolts and screws for general purposes of certain known forms and measurements, and he believed that now every marine engine and every locomotive in this country had the same screw for every given diameter. Sir Joseph then referred to the duplex lathe obtaining a balance of forces, and wherever the lathe was employed prices were reduced 40 per cent., in addition to which 40 per cent. more work was produced. At one time a workman was paid 12s. per square foot for surface planing, now it was reduced to 1d. per foot.

THE ARCHITECTS' BENEVOLENT SOCIETY.

A MEETING of the Council, past members of Council, and a few contributors to the Society, was recently held at the Institute of British Architects, to present a testimonial to Mr. John Turner, on his retirement from the office of honorary secretary to the Society, which he had held for over twenty-five years.

In the unavoidable absence of the president, Mr. Sydney Smirke, R.A., Mr. David Mocatta occupied the chair. A statement setting forth the amount of subscriptions received, viz., 58*l.* the purchase of a gold hunting-watch, with a suitable inscription engraved inside the top case, chain, and seal (the testimonial selected by Mr. Turner), having been read,

The Chairman, in making the presentation, alluded at some length, in appropriate terms, to the valuable services rendered by the late honorary secretary, and the advantage which had accrued to the Society from his untiring exertions.

Mr. Turner feelingly responded to the kind expressions addressed to him by the chairman.

The thanks of the meeting were voted to Mr. Mocatta for his able fulfilment of the duties of chairman; and to Mr. George Mair, who had undertaken the duties of treasurer and secretary of the testimonial fund; and both gentlemen having responded, the chair was vacated and the meeting terminated.

NEWCASTLE BUILDING BYE-LAWS.

A MEETING of architects, builders, and others interested in the Building Bye-laws was held on the 25th ult. in the conversation-room of the Mechanics' Institute, Newcastle. Mr. W. Temple was in the chair. The secretary (Mr. R. A. Storrar) read a statement as to the complaints which the deputation laid before the Town Improvement Committee. The first complaint was as to the thickness of party walls. With respect to the rejection of plans, and no reason being assigned for such rejection, it was suggested that reasons why plans were rejected should be given when such rejection was intimated, and that the officials be instructed to inspect plans on their presentation, and to point out to the depositors technical errors or omissions, and give the depositors an opportunity to alter them; and, further, that all rejected plans be returned to depositors. It was also stated that serious complaints were made with reference to the manner in which builders and others had been dragged before the police court, although they had to the full extent of their ability complied with the conditions of the building bye-laws; and in many cases they had improved upon the quality and convenience of the buildings they were erecting, for which they were sought to be fined, and some alteration in those cases was required. It was suggested that a thorough revision of the building bye-laws should be made, and the provisions of the Act of 1871 incorporated in the bye-laws, and that the bye-laws should be so framed that builders and others desirous of abiding by them should be enabled to determine, by a perusal of them, what was demanded, and how the demands were to be accomplished; and with this view a sub-committee of the Town Improvement Committee might be appointed, to meet a deputation of builders, and enter upon the matter fully, and report to the Town Improvement Committee thereupon. After a discussion, it was resolved "That all interested endeavour to obtain copies of the proposed new bye-laws, and that the secretary be instructed to call another meeting, when the matter may be fully discussed, and a committee appointed to watch the interests of the builders and others." The meeting then concluded.

BURSTING OF AN IRON TANK AT ST. GEORGE'S HOSPITAL.

AN extraordinary accident occurred at St. George's Hospital, Hyde Park-corner, on the 3rd inst., when the large water-tank which had been placed at the top of the building as a safeguard against fire suddenly burst, and the immense volume of water thus liberated burst through the roof, and fell into the ward below. This tank was situate on the top of the hospital, on the Grosvenor-place side, a little north of the entrance-hall. It was of cast iron. It was erected seven years ago, and there was not the slightest reason to suspect it was in any way defective. The first intimation of anything being wrong was water dropping from the ceiling of the top ward. Soon afterwards a terrible crash was heard, and nearly the whole of one side of the iron tank, weighing about two tons, fell through the roof of the building, and forced itself through the various upper wards into the students' room on the ground floor, carrying portions of the wards, with the beds and their occupants, into the lower room.

It is stated that the Queen, who is patron and president of the hospital, telegraphed for particulars upon hearing the first alarming reports of the disaster; the Prince of Wales and the Duke of Cambridge, who are among the vice-presidents of the hospital, came in person, and so did Prince Teck. The Duke of Wellington, the Duke of Westminster, and the Duke of Grafton came early to the scene of the wreck, and many offers of assistance were made, but room was found for all the patients in beds in the other wards. The students injured out of seven who were in the students' room were Mr. Vasey and Mr. White. The tank was built six years ago by Messrs. Easton & Co., of Erith. It was of iron plates ⅞ in. thick. The surveyor to the hospital, Mr. Salter, made his annual report on the buildings a fortnight ago, after inspecting them, and found no fault in the tank. An inspection of the broken tank shows that it is, roughly, 12 ft. deep and 10 ft. square. It is calculated to have contained at the time of the accident 25 tons of water, or 5,000 gallons. Its total capacity was 7,000 gallons. The east side of the tank is that which has given away. The iron has not parted from the rivets, but there is a large, jagged hole broken in it, approximately a circle with a diameter of 6 ft. It is not one plate that is broken, but several. All are on the east side. The tank was placed on iron girders, and these rested on brick supports. A leak of minute width, but 18 in. long, running down the tank not quite perpendicularly, was first observed: suddenly the whole side seemed to come out, and the superintendent and engineer who were examining it narrowly escaped being swept away.

It has been suggested to us that a great gathering on the roof on the occasion of the Prince of Wales's return may have had something to do with the break-down, but we know of nothing to justify the suggestion. The fact is that iron structures are always getting weaker. The occurrence should lead to very strict surveys in town and country.

THE TURF CLUB IN PICCADILLY.

ANOTHER new club-house, which has been in the builders' hands during the last few months, will shortly be completed and opened. Some time go the Duke of Grafton sold his town mansion, Grafton House, at the corner of Grafton-street, Piccadilly, to the Turf Club, and the building has undergone an entire reconstruction, so as to adapt it to the purposes of the club. Although the old external brick walls to Piccadilly and Clarges-street have been allowed to remain, both frontages have been architecturally transformed, and now present handsome elevations, harmonising with the several structures in the locality. In the Piccadilly front two bays have been thrown out, going up nearly the whole height. The elevation is surmounted by a balustrade, with vases for terminals. The Clarges-street frontage has also been restored, and new windows, with Portland stone sills and mullions, introduced, the elevation being surmounted by a balustrade and terminals uniform with the Piccadilly frontage. The principal entrance to the club is at the Clarges-street frontage, under a portico.

The floor of the vestibule, and the inner hall, approached from the entrance, is paved with marble, and the principal staircase from the vestibule to the first floor is also laid with marble. The ground-floor contains the coffee-room, the morning-room, and the reading-room, with principal frontage to Piccadilly. The first floor contains the dining-room, drawing-room, writing-room, and card-rooms; whilst the two upper floors are entirely set apart as bedrooms for the members of the club. The kitchen and cooking department are entirely distinct from the club buildings, a separate building for culinary purposes having been erected at the rear. The basement and sub-basement will contain the housekeeper's apartments and the wine-cellars.

Mr. John Norton is the architect, and Messrs. Cubitt & Co. are the contractors. It is expected that the inauguration of the club will take place in a few weeks.

RE-BUILDING OF ST. ANNE'S CHURCH, SOUTH LAMBETH.

ONE of the oldest churches in the parish of Lambeth is about to be demolished, to be replaced by a new structure more in accordance than the present edifice with the church architecture of the times. We allude to St. Anne's Church in South Lambeth-road, which was built in the eighteenth century, there being at that time no other Church of England building between Lambeth Palace and Clapham. With the exception of the parish church of St. Mary, Lambeth, it is said to be the most ancient church in the parish. At the time the old church about to be removed was built, the well-known Mr. Dollond, who has a lasting celebrity in connexion with telescopes, was the chairman of the building committee. It was originally built as a proprietary chapel, and called South Lambeth Chapel, and it was only in 1869 that it was called St. Anne's Church when first consecrated by the bishop of the diocese, who only consented to perform the ceremony on receiving an assurance that immediate steps would be taken to alter and enlarge it; but the difficulties and expense attendant upon obtaining possession of former proprietary rights, and the conveyance of the site to the Ecclesiastical Commissioners, have hitherto prevented the rebuilding of the church being carried out. Although the present structure is very unsightly, some portions of it will be retained, and altered so as to harmonise with the intended new edifice, the architect for which is Mr. Parkinson. The estimated cost of the new church, which will be much larger than the present building, is between 4,000*l.* and 5,000*l.*

BINFIELD'S PROCESS FOR TRANSFERRING WATER COLOUR DRAWINGS TO WOOD.

THE invention of Mr. Binfield has for its object to enable the artist to produce his work with great rapidity and ease, and retain for sale the original drawings.

The process consists simply in using two preparations called Lignotints, which wash and flow freely, and require no education in their use. When the drawing is finished, it is placed face down on the wood block, put under pressure for a few minutes, or burnished by hand, and the result is a perfect transfer, with every tint, tone, or mark on the wood, whilst the original drawing is uninjured. Any tones or washes compounded with the Lignotints and Chinese white are equally applicable to the invention. We have seen some drawings transferred with great completeness. If this can always be effected with certainty the invention cannot fail to prove valuable.

BREAD-BAKING OVENS.

SIR,—If your correspondent "Devoniensis" would try ground fire-clay I think he would find it answer his purpose. I have never seen anything else used for furnaces, kilns, and ovens, and should certainly never dream of using lime, cement, or plaster of Paris.

JOHN M. GIBSON.

MASTERS AND MEN.

Wolverhampton. — By mutual arrangement with their employers, upon whom they had served notices for an advance in wages, the carpenters, plasterers, bricklayers, and labourers, at Wolverhampton have obtained a rise of ½d. per hour. They now receive,—the first three 8d. per hour and the labourers 5½d. By this rise the wages in the building trades in Wolverhampton are brought up to a level with the Birmingham scale. The decision having been arrived at without the intervention of Mr. A. Young, the arbitrator, that gentleman has been presented with a pair of white kid gloves.

Southport.—The strike of joiners at Southport still continues.

Carnarvon.—At Carnarvon, on the 3rd inst., twelve quarrymen were fined 5*l.* each, and ordered to find sureties for twelve months, for being concerned in a riot which took place at Hafod-y-Wern Slate Quarry, and which arose out of some trade dispute.

Fleetwood.—Following the example of their Southport brethren, the Fleetwood joiners have given three months' notice that they require an advance to 8½d., the present rate being 7½d., and the time fifty-four hours per week.

Cardiff and Newport.—The painters, both of Cardiff and Newport, are now on strike. At the former town the men have called an open-air mass meeting, and it is understood that they have formed a co-operative body, with a view to do work on their own account.

Bristol.—The Master Builders' Association of Bristol have resolved to withdraw the lock-out of painters, and have offered work to the men at the old rate of 6½d. an hour. It is said that the non-society men are likely to accept the offer, but that the society men have announced their determination to continue the strike.

Greenock.—Following the example given them by the master masons, the master joiners of Greenock have resolved to summon foreign aid against the workmen. They have agreed to telegraph to Norway to ascertain whether craftsmen can be obtained in that country to take the place of the Scottish joiners on strike; and should an encouraging answer to this telegram be received, a deputation is to cross the ocean to enlist the Scandinavians.

Doncaster.—The Doncaster masons have refused an increase of 3s. per week and a reduction of 4½ hours, and are still on strike, demanding an assurance from the masters that they will not bring to the town certain foreign work, dressed stones, &c., and asking half-pay when unable to work through bad weather.

Lanarkshire. — The masons of Motherwell, Bellshill, Hamilton, Holytown, Uddingstone, Wishaw, &c., have commenced work at a reduction of wages. Those who were formerly paid 10d. per hour have been reduced 1d., and those who had 9½d. have been reduced ½d.

Whitehaven. — The journeymen painters of Whitehaven petitioned the masters for an advance of wages from 26s. to 30s., which has been granted by the masters without any stoppage of business.

Mossley.—The notice of the masons within the district of the Mossley Local Board for an increase of 3s. per week in their wages expired on the 1st inst., when the masters agreed to give the advance asked for. The wages will now be 36s. per week in summer and 33s. per week in winter. The masons' labourers have also given notice of an advance of 2s. per week on their present rate of wages, and their notice also expired on the same date, but they agreed to extend the notice for another month till the demand of the masons was settled.

Glasgow.—The Glasgow joiners, to the number of between 2,000 and 3,000, have struck work in the shops where the employers have refused to grant an advance of wages from 8½d. to 9d. per hour. Since the strike commenced the men have been holding daily meetings, and at the gathering on the 31st ult. it was reported that eighty-two masters who were not members of the Association had conceded the advance, and signed the bye-laws. On account of this a great number of the men who were on strike have returned to work.

Darlington.—The Darlington plumbers have asked their employers to concede one hour per week. Hitherto they have been in the habit of leaving work on Saturdays at one o'clock, and they ask to be placed on an equal footing with the other mechanics of the town, and end their week's work at noon. They also demand ½d. per hour extra wages.

COMPENSATION CASE.

MOLYNEUX *v.* CHESHIRE LINES COMMITTEE.

A SPECIAL jury was empanelled at St. George's Hall, Liverpool, on the 29th ult., under the direction of the Sheriff's Assessor, Mr. J. J. Aston, Q.C., to award the amount of compensation due to Mrs. Molyneux, of Staplands, for the land taken by the Cheshire Lines Committee from her estate, for the construction of their branch line of railway from Hunt's-cross Station to the North Docks, Liverpool.

The company have carried their line through a portion of the most valuable building land in the neighbourhood of Liverpool, passing through Childwall Valley, Broad Green, Knotty Ash, West Derby, and Walton.

Mr. Sherlock, Mr. Lewis Hornblower, Mr. Wright, and Mr. Gustavus Hamilton (architects, surveyors, and valuers, Liverpool), Mr. Retford, C.E. (Manchester), and Mr. Brooks (Huddersfield), gave evidence in support of the claimant. Their valuations for land taken and compensation for severance averaged 9,150*l.*; while Mr. W. H. Weightman (Liverpool), Mr. Hewitt, and Mr. John Cross (Manchester), on behalf of the Committee, estimated the claim at an average of 3,774*l.*

The jury having heard the speeches of counsel, and the summing up of the learned assessor, awarded the sum of 7,204*l.* 17*s.* 4*d.* to the claimant.

OBSTRUCTIONS OVER FOOTWAYS.

RECENTLY the Vestry of Shoreditch took proceedings at Worship-street Police-court against a tradesman named Reed, under the Police Act, for setting up a show-board which projected 11½ in. over the footway at a height of 2 ft. 3 in.

These facts having been proved, and the question of the right of user being excluded (as the projection could not be shown to have been coeval with the dedication of the street), evidence was tendered by the prosecution that the projection was a substantial obstruction, and counter evidence was tendered by the defence that it was not an obstruction. The Magistrate, Mr. Bushby, refused to receive such evidence on either side as being irrelevant, and upon the facts, decided that the show-board came within the scope of the 2nd and 3rd Vic., cap. 26, sec. 60, sub-sec. 7, and imposed a fine of 4*s.* The defendant being dissatisfied with this decision, the magistrate stated a case, but limited the question to the rejection of evidence. If he was right in such rejection the conviction was to stand, if not, the case to be remitted to the magistrate to be further heard. The case was before the Queen's Bench Division a few days ago, when Mr. M'Intyre, for the appellant, contended that the magistrate ought to have had evidence of persons being substantially incommoded, because, after all, this projection might have been in a recess between two projecting houses, and so no obstruction. But the court, without calling upon the respondents, affirmed the conviction with costs, and held that the magistrate was quite right upon the facts presented to decide, and that if a hundred witnesses were called to prove that they were not obstructed, it would be no answer to the summons. This decision is identical with that in "Gabriel *v.* St. James's, Westminster," in which a projecting lamp, 10 ft. high, was the annoyance complained of.

LIABILITY OF SUB-CONTRACTOR FOR "SCAMPED" WORK.

GRIFFITHS *v.* POTTER.

IN this case, heard in the Exchequer Court, First Division (sitting at Guildhall), before Mr. Baron Bramwell and a special jury, the plaintiff was Mr. John James Griffiths, stone-merchant, mason, and pavior, of 283, Kingsland-road, and the defendant was Mr. Henry Potter, contractor, of Alfred-street, Stepney. The action arose out of the construction of the "Finsbury-avenue sewer," for the parish of St. Leonard, Shoreditch. It was stated on behalf of the plaintiff that he brought this action rather for the sake of vindicating his reputation for integrity than with the view of recovering damages.

It appeared that the plaintiff took the contract for executing the sewer and paving works in Finsbury-avenue. He sublet the sewer work to the defendant, who was to do the work, in accordance with plan and section, at the rate of 8*s.* per foot run, in 9-in. brickwork throughout. The defendant proceeded with the work, and on May 7, 1875, the plaintiff paid him 100*l.* on account, believing a portion of the work had been properly done. Early in June plaintiff received the defendant's account, which he sent to Mr. Perrett, the vestry surveyor, to check the "extras." On the 5th and 8th of June plaintiff wrote to the defendant to connect the drain near Queen's-square, and defendant arranged with the vestry surveyor to do it on the 10th at nine in the morning. When Mr. Perrett went to the works with his assistant, Mr. Davis, they found the connexion had been made. It was subsequently discovered that the part of the sewer into which the drain was made was only 4½-in. work instead of 9-in. work; and it was afterwards found that a large portion of the sewer was done in 4½-in. work only, instead of the 9-in. work contracted for. An investigation into the matter was made by a committee of the vestry, when the defendant for the first time stated that he had sublet the contract to a person named Munsen, who alone was to blame. The plaintiff, in order to vindicate his reputation, asked the defendant to prosecute Munsen, offering to pay a portion of the expense. Defendant declined to do this, but his solicitor proposed that he (defendant) should make a statutory declaration of the facts instead, but after various excuses the defendant formally refused to make such declaration. Plaintiff had been obliged to repave the avenue at a cost of 69*l.* 10*s.* In cross-examination, plaintiff said he believed the defendant knew of the fraud.

Mr. George Charles Perrett said he was surveyor to the vestry of St. Leonard, Shoreditch. Witness was invariably at the works at nine in the morning and five in the evening, and went there three times some days. He never saw any 4½ in. work exposed. When witness went to fulfil the appointment made for connecting the drain, he found that the men had worked all night, and the work was covered in. About two-thirds of the sewer was afterwards found to be only 4½-in. work, instead of 9-in.

Robert Mason deposed that he was an excavator, and was employed by the defendant upon the work for fourteen or fifteen days. Saw the work going on at night. Some of the crown of the arch was then done in 4½-in. work. The men covered it up as soon as it was done. A 9-in. end was always put right for Mr. Perrett to see in the morning.

Henry Potter, the defendant, stated that he was a contractor, and that his clerk sublet the construction of the sewer in question to Munsen. In June plaintiff told him (defendant) that the work had been "scamped."

In cross-examination defendant stated that when he last saw Munsen he said he was coming to attend this trial.

Mr. Baron Bramwell.—There must be a verdict for the plaintiff, and Mr. Benjamin (plaintiff's counsel) does not press for damages. I am sure the jury will agree with me in saying that the plaintiff at least is free from all blame in this matter.

The jury intimated their assent, and found a verdict for the plaintiff for 69*l.* 10*s.*

His lordship gave judgment for that amount, and certified for a special jury.

DAMAGE TO GOODS IN TRANSIT.

SINCLAIR *v.* THE GREAT NORTHERN RAILWAY COMPANY.

THIS action was tried at the Westminster County Court, recently, in which the plaintiff, a marble merchant, of Princes-street, Leicester-square, sought to recover the sum of 7*l.*, for damage done to a marble mantelpiece, in transit from Potter's Bar to London. Mr. Harmsworth appeared as standing counsel for the company.

From the plaintiff's opening it transpired that he sent a marble mantelpiece to a customer at Warren's Wood, which, not being approved of, was returned to the plaintiff.

James Maxwell, in the employ of the plaintiff, proved that the article in question was properly packed when it left the plaintiff's shop, and John Newton, from Warren Wood, proved the receipt of the packages in good condition, where they remained three weeks, and returned in the same condition to the sender, when William Bennett, the plaintiff's foreman, proved receiving the packages back, one of which was in a broken condition.

Joseph Dulley, manager to the plaintiff, said he opened the packages, and found one damaged to the amount sued for, and that he had applied to the company for compensation, who refused to make any, in consequence of which the present action was brought.

This being the plaintiff's case, Mr. Harmsworth said that the company had really no case to defend, as it had not been proved by the plaintiff where the damage had accrued, which might have occurred between Potter's Bar and Warren Wood by the carrier, who was not the agent for the company; and in reality the company were not liable.

Thomas Bonce, the checker at King's-cross, proved that when the packages reached that station from Potter's Bar they were uninjured; and Robert Hill, a porter at the same station, gave corroborative evidence, in which he was supported by that of Hold, the company's carman.

The Judge said that from the evidence of the company's witnesses there was in reality no case against them, and, therefore, he should rule in favour of the defendants; and, on the application of Mr. Harmsworth, granted the costs of counsel, attorney, and seven witnesses.

A DISPUTED CONTRACT.

ALDOUS *v.* PAYNE.

IN this case, heard in the Brompton County Court on the 24th ult., before Mr. Serjeant Wheeler, a claim was made for 21*l.*, for laying out grounds and garden.

Mr. Aldous, the plaintiff, said he was a florist and gardener at South Kensington, and last year he was engaged by the defendant to prepare plans and estimate for laying out the grounds and garden at Mornington House, North-end, Fulham. He had to obtain assistance in the matter, and the plans and specifications were submitted to the defendant and approved of, but after the work was done defendant refused to pay, on the plea that it was not done according to order.

John Higham, ornamental gardener, having given evidence in support of the plaintiff's case,

Mrs. Payne, the defendant, said she instructed the plaintiff to lay out the garden after the pattern of Mr. Scott Russell's garden, but there was nothing said about "plans," because there was no necessity to prepare any.

After some further evidence had been given,

His Honour pointed out the difference between an estimate and a contract, and ultimately gave judgment for the plaintiff for 12*l.*

ACTION BY ARCHITECTS TO RECOVER COMMISSION FROM A TRADESMAN.

WALKER AND ELSOM *v.* WEEKES.

THIS was an action before Mr. Baron Huddleston, in the Exchequer Division, to recover 160*l.*, claimed as commission upon a certain building transaction.

Mr. Day, Q.C., in opening the case, stated that the Messrs. Walker & Elsom were architects, and had been engaged by a Mr. Higgs, a person of some notoriety a few years ago, in connexion with the building of a palatial mansion and other structures in the neighbourhood of Twickenham. This Higgs was apparently but a clerk in an office in the City, but managed to amass a large amount of wealth, and to live in rather a princely style. In 1868 Mr. Higgs, being desirous of adding some horticultural attractions to his residence on the banks of the Thames, the defendants, Messrs. Weekes, who are horticultural builders in Brompton and Chelsea, were applied to for the purpose of getting certain conservatories or other structures erected. Mr. Alfred Weekes, a supposed partner of the defendant's firm, in the course of the communication which took place between Mr. Elsom, one of the plaintiffs, and himself upon the subject of the required additions, promised the plaintiffs five per cent. commission upon the transaction arising from this negotiation, and Mr. Elsom agreed to accept the same. This action was to recover 160*l.*, together with certain charges accruing on the delay that had occurred, amounted altogether to 250*l.*

Mr. Elsom, the plaintiff, in his cross-examination, stated that he was not acquainted with the defendants before the present transaction. He had been acquainted with Mr. Higgs for some years, having been engaged with his partner as architect in the building of stables. He had an agreement with him, but not in writing, by which he was to receive 5 per cent. on the cost of the structure. He would not have made a claim against the defendant unless Mr. Alfred Weekes had himself offered 5 per cent., saying it was the custom of the firm to make that allowance.

Mr. Torr.—Then, in fact, you did nothing for this sum. You accepted it as a mere gratuity?

Witness.—Yes; I submitted my drawings to the defendants. I had no authority at the time to employ the defendants specially.

Certain law points having been argued by the learned counsel on both sides, they ultimately agreed to submit the matter to the decision of the learned judge.

Mr. Baron Huddleston stated that as his opinion had been asked, and as he had an opportunity of speaking to the Lord Chief Baron (who was presiding in the next court), he had no hesitation in giving it, and that was, that there was no evidence to go to the jury in support of the plaintiffs' claim, and therefore he should order a nonsuit.

THE GREAT DOLWILYM CROMLECH.

THE letter of your correspondent, "T. N.," requires a brief answer. The illustration of this cromlech as given in the *Builder* is the first published engraving of the structure having any claim to a decided value or proper size. No claim was made in the *Builder* towards making the cromlech known to the public for the "first time." As to the trifling little woodcut in Dr. Nicholas's book, its accuracy has not been disputed, as it is evidently copied from an old and well-known photograph taken from a bad point of view. The "notice" in Dr. Nicholas's work amounts to a few lines only of perfectly valueless description. Neither cut nor description is of sufficient moment for any reference in your columns. As to the Cambrian Archæological Association having "at last found out" this cromlech, "T. N." needs to be informed that the Cambrian Association published two wood engravings, a lithograph, and an exhaustive description, together with the reproduction of some previously published notes by Sir Gardner Wilkinson on the same structure, in their *Journal* for 1872,—the year in which Dr. Nicholas's work first saw the light.

CAMBRIAN.

A NUISANCE AT FINCHLEY.

SIR,—Close to my house and garden is a parish cesspool, which was built as a temporary means of obviating the nuisance arising from the sewage of the village of Whetstone running on to the surface of a field adjoining my garden. The stench arising is at all times most offensive, and I constantly have to send my children into the house, for fear of fever.

I have complained to the Barnet Sanitary Board, and their surveyor tells me that he considers my complaint coloured, because I have not actually had a case of fever in my house during the three years I have lived here. True; but at the other end of the field there has been fever amongst the cottagers, and as the Great Northern High Barnet line runs close by the field, Goodness knows how many cases of fever are carried into London by visitors. One of the men working on the line lives in a cottage at the other end of the field, and he has only just recovered from a most serious case of fever. In addition to this, tens of thousands of school children and others will come down this line in a few weeks, and will continue to come all through the summer months, to enjoy their treats in Hadley Wood; but who can say how many of them will return to sicken and die of fever contracted from this grave public nuisance?

GEORGE VINING.

*** Write to the Central Authority, Whitehall.

THE FOOTWAY AT CHARING CROSS.

SIR,—The Metropolitan Board of Works have yielded to pressure to some extent, but abide by their determination that the footway on the frontage to Trafalgar-square need not be so wide as that along Northumberland-avenue by 3 ft., or quietly suggest that if 12 ft. is insufficient the balance can be taken out of the Strand roadway. Evidently they consider the traffic along the Strand quite unimportant, so that they may be allowed to increase the profit balance on their costly adventure. But I suppose there is no hope, and that a mistake will be perpetrated such as the Board would afterwards give their ears to undo.

Z.

THE ENDOWMENT OF GENIUS.

SIR,—There has of late been much talk, as you say, about the endowment of research. This title may be a step towards a correct notion which has not yet attained its ultimate form. It is only partially developed, and if it were acted upon as now expressed, would lead to a considerable expenditure of money, without producing any adequate results. What we should really advocate is the endowment of men. This has been the policy which has led to the most splendid results in wisely-governed states, and in all ages. We rely too much on the machinery of institutions to accomplish our ends. This leads to a vast amount of patronage, under which nations generally become consumptive and break down. Institutions may do very well in the jog-trot of peace and easy circumstances, but when the pinch and strain come these give way. The clamour is then for men, and if a country has not taken care of them, she will either be in sore distress, or absolutely ruined. This is England's weak point. Dilettanti foppery flourishes to the exclusion of thoroughness, both in science and art. It may be urged that the true genius will work on under the most dire disadvantages, and without the slightest recognition from the charmed domain of showy seeming. This is quite true, but how much does a nation lose by the impediments cast in the way of a great man's life? Who shall answer that? To endow research, however, would be but to induce a lot of pigmy minds to pose themselves in the attitudes of giants, and to exclaim, "We will be discoverers!" The nation would, in that case, doubtless have most wonderful discoveries made. Germany is wiser in its generation, and when she finds a great man takes care of him. It is a sign of mental health in a State when it knows a great man, and not only recognises, but takes care of him. We stone genius to death with difficulties. The kind of men we require is not to be made by the endowment of research. I think it was Mrs. Glasse who said, first catch your hare and then cook him. In a somewhat similar vein I would say to those who are advocating the endowment of research,—first catch your genius, but in this case do not *do for* and cook, but endow him.

METER.

CONCRETE BUILDING.

SIR,—The generally-expressed and accepted opinion at the meeting of the Royal Institute of Architects was, most decidedly, in favour of concrete construction as the best when properly treated.

The question of the evening was mostly lost sight off,—that is, its decoration and finish; but as the essence of its success commercially lies in that direction, it will have to be more thoroughly considered at some future time. Concrete has a brilliant future.

It seems at last a new era has set in for the construction and decoration of houses, fittings, furniture, and wares, as indicated by new systems, materials, and designs, and their combined effects. A thorough revolution in building operations has commenced.

Mr. A. Payne objected to the mode as employed in concrete building with the present building apparatuses, and patching on of pilasters, &c., that not being the science of its application. These are correct views against our present concrete builders.

Science, art, and skill are essential to all successful results in establishing one of the greatest reforms that ever took place in building, building operations, decorations, &c., appertaining thereto; therefore, the advocacy of our concrete builders for unskilled labour must be wrong, raising distrust of the qualified and impeding real progress by accidents. Constant and qualified supervision is the necessity, and a scarcity of skill the want. That being so, the more the subject is discussed the better by the architects, engineers, and mechanics, separately and in union, until a thoroughly certified qualified body of practical men is established in each respective department, fulfilling all the branches necessary for competency.

A PRACTICAL OPERATIVE.

The National Gallery.—In the House of Commons, on the 30th ult., Lord H. Lennox, in answer to Mr. Cowper-Temple, said the additions to the National Gallery were now completed, and would be forthwith handed over by the Office of Works to the trustees of the National Gallery.

STAINED GLASS.

Gloucester.—The great window of the north transept of the Cathedral has been filled with painted glass, as a memorial of Sir Michael Hicks Hicks-Beach, bart., M.P., and Lady Caroline Susan Beach. The window is by Messrs. Hardman, of Birmingham, and subjects are connected with the life of St. Paul. In the two sets of eight lights under the transom are represented St. Paul restored to sight, introduced to the apostles, Elymas the sorcerer, the offer of the priest of Jupiter to sacrifice to Paul and Barnabas, Council at Jerusalem, Paul casting out a spirit of divination, restoring Eutychus to life, and before Felix; Paul let down in a basket, making tents, beaten with rods, stoned, dragged out as dead, delivered from prison, shipwrecked, shaking off the viper. Four subjects occupy the eight lights over the transom,—stoning of Stephen, conversion of St. Paul, the third Heaven, the Martyrdom. In the centre, over these, our Lord is represented; on either side and beneath are cherubim, and in two uppermost lights are cherubim with crown and palm. At the base are the armorial bearings, and an inscription.

St. Giles's Cathedral (Edinburgh).—Another stained-glass window has been placed in the south aisle of St. Giles's Cathedral, and, in accordance with the plan laid down by the Restoration Committee, the subjects illustrated are the parables of "The Talents" and "The Ten Virgins." The inscription underneath the window reads,—"In memory of Alexander Clapperton, merchant, Edinburgh, born 1782, died 1849; and Ann Hume, his wife, born 1792, died 1873. Erected by their sons, John and Alexander Clapperton, 1876." The designs, and the execution of the work, are by Messrs. Ballantyne & Son, carried out under the direction of Mr. Robert Herdman, R.S.A.

Coatbridge.—The parish church of Coatbridge has just received an addition by the erection in the south gallery of two painted windows, presented by Mr. A. Whitelaw, M.P., and Mr. Wm. Weir, of Kildonan. The treatment adopted corresponds to that of the other windows in the church, having a single figure occupying the main position in each light, with a picture underneath, illustrative of a scene in the life of the apostle depicted. The figures are those of James, Paul, Peter, and Jude; and the pictures represent the martyrdom of James, the preaching of Paul at Athens, the calling of Peter, and the miraculous draught of fishes. The tracery lights above the main windows represent two angels, carrying between them a scroll inscribed with a text. The window is by Messrs. Morris & Co.

Northampton.—The east window of St. Giles's Church, Northampton, has recently been filled with stained glass at the expense of Mr. T. Portal, of Springfield, to the memory of his father, mother, wife, and two children. The subject of the window is the "Te Deum," and the work has been carried out by Messrs. Clayton & Bell. The window consists of five lights, the centre light containing a representation of the Saviour in majesty, surmounting a representation of the Holy Innocents. The two adjoining lights contain figures of angels glorifying the central figure of our Lord, and surmounting figures of Daniel and St. Catherine, whilst the tops of the lights contain respectively figures of David and St. Cecilia. The right-hand light contains at the top figures of St. Barbara and St. Mary Magdalene; in the centre, figures of St. Agnes and St. Lucy; and at the base, figures of St. Hilda and St. Susana. The left-hand light contains, in corresponding positions, figures of St. Peter and St. John; St. Giles and St. Edward the Confessor; Moses and Joshua.

Evesbatch.—Two stained-glass windows have been completed at the recently-restored church of Evesbatch, near Malvern, by Messrs. Wailes & Co., of Newcastle-upon-Tyne, one at the west end representing St. Andrew, after whom the church is named, the other on the south side of the chancel representing the Nativity of our Lord. The latter was the gift of the Misses Perrins, of Malvern.

West Derby.—The five-light east window of the new Thornton chancel at St. James's Church, West Derby, has been filled with stained glass by Messrs. Wailes, of Newcastle. It contains medallions with subjects of our Lord's Passion. The Crucifixion occupies the central place, with the Ascension above it, the triumphal entry and agony on one side, and the entombment and resurrection on the other, the institution of the

MASTERS AND MEN.

Wolverhampton. — By mutual arrangement with their employers, upon whom they had served notices for an advance in wages, the carpenters, plasterers, bricklayers, and labourers, at Wolverhampton have obtained a rise of ½d. per hour. They now receive,—the first three 8d. per hour and the labourers 5½d. By this rise the wages in the building trades in Wolverhampton are brought up to a level with the Birmingham scale. The decision having been arrived at without the intervention of Mr. A. Young, the arbitrator, that gentleman has been presented with a pair of white kid gloves.

Southport.—The strike of joiners at Southport still continues.

Carnarvon.—At Carnarvon, on the 3rd inst., twelve quarrymen were fined 5*l.* each, and ordered to find sureties for twelve months, for being concerned in a riot which took place at Hafod-y-Wern Slate Quarry, and which arose out of some trade dispute.

Fleetwood.—Following the example of their Southport brethren, the Fleetwood joiners have given three months' notice that they require an advance to 8½d., the present rate being 7½d., and the time fifty-four hours per week.

Cardiff and Newport.—The painters, both of Cardiff and Newport, are now on strike. At the former town the men have called an open-air mass meeting, and it is understood that they have formed a co-operative body, with a view to do work on their own account.

Bristol.—The Master Builders' Association of Bristol have resolved to withdraw the lock-out of painters, and have offered work to the men at the old rate of 6½d. an hour. It is said that the non-society men are likely to accept the offer, but that the society men have announced their determination to continue the strike.

Greenock.—Following the example given them by the master masons, the master joiners of Greenock have resolved to summon foreign aid against the workmen. They have agreed to telegraph to Norway to ascertain whether craftsmen can be obtained in that country to take the place of the Scottish joiners on strike; and should an encouraging answer to this telegram be received, a deputation is to cross the ocean to enlist the Scandinavians.

Doncaster.—The Doncaster masons have refused an increase of 3s. per week and a reduction of 4½ hours, and are still on strike, demanding an assurance from the masters that they will not bring to the town certain foreign work, dressed stones, &c., and asking half-pay when unable to work through bad weather.

Lanarkshire. — The masons of Motherwell, Bellshill, Hamilton, Holytown, Uddingstone, Wishaw, &c., have commenced work at a reduction of wages. Those who were formerly paid 10d. per hour have been reduced 1d., and those who had 9½d. have been reduced ½d.

Whitehaven.—The journeymen painters of Whitehaven petitioned the masters for an advance of wages from 26s. to 30s., which has been granted by the masters without any stoppage of business.

Mossley.—The notice of the masons within the district of the Mossley Local Board for an increase of 3s. per week in their wages expired on the 1st inst., when the masters agreed to give the advance asked for. The wages will now be 36s. per week in summer and 33s. per week in winter. The masons' labourers have also given notice of an advance of 2s. per week on their present rate of wages, and their notice also expired on the same date, but they agreed to extend the notice for another month till the demand of the masons was settled.

Glasgow.—The Glasgow joiners, to the number of between 2,000 and 3,000, have struck work in the shops where the employers have refused to grant an advance of wages from 8½d. to 9d. per hour. Since the strike commenced the men have been holding daily meetings, and at the gathering on the 31st ult. it was reported that eighty-two masters who were not members of the Association had conceded the advance, and signed the bye-laws. On account of this a great number of the men who were on strike have returned to work.

Darlington.—The Darlington plumbers have asked their employers to concede one hour per week. Hitherto they have been in the habit of leaving work on Saturdays at one o'clock, and they ask to be placed on an equal footing with the other mechanics of the town, and end their week's work at noon. They also demand ½d. per hour extra wages.

COMPENSATION CASE.

MOLYNEUX *v.* CHESHIRE LINES COMMITTEE.

A SPECIAL jury was empanelled at St. George's Hall, Liverpool, on the 29th ult., under the direction of the Sheriff's Assessor, Mr. J. J. Aston, Q.C., to award the amount of compensation due to Mrs. Molyneux, of Staplands, for the land taken by the Cheshire Lines Committee from her estate, for the construction of their branch line of railway from Hunt's-cross Station to the North Docks, Liverpool.

The company have carried their line through a portion of the most valuable building land in the neighbourhood of Liverpool, passing through Childwall Valley, Broad Green, Knotty Ash, West Derby, and Walton.

Mr. Sherlock, Mr. Lewis Hornblower, Mr. Wright, and Mr. Gustavus Hamilton (architects, surveyors, and valuers, Liverpool), Mr. Retford, C.E. (Manchester), and Mr. Brooks (Huddersfield), gave evidence in support of the claimant. Their valuations for land taken and compensation for severance averaged 9,150*l.*; while Mr. W. H. Weightman (Liverpool), Mr. Hewitt, and Mr. John Cross (Manchester), on behalf of the Committee, estimated the claim at an average of 3,774*l.*

The jury having heard the speeches of counsel, and the summing up of the learned assessor, awarded the sum of 7,204*l.* 17s. 4d. to the claimant.

OBSTRUCTIONS OVER FOOTWAYS.

RECENTLY the Vestry of Shoreditch took proceedings at Worship-street Police-court against a tradesman named Reed, under the Police Act, for setting up a show-board which projected 11¼ in. over the footway at a height of 2 ft. 3 in.

These facts having been proved, and the question of the right of user being excluded (as the projection could not be shown to have been coeval with the dedication of the street), evidence was tendered by the prosecution that the projection was a substantial obstruction, and counter evidence was tendered by the defence that it was not an obstruction. The Magistrate, Mr. Bushby, refused to receive such evidence on either side as being irrelevant, and upon the facts, decided that the show-board came within the scope of the 2nd and 3rd Vic., cap. 26, sec. 60, sub-sec. 7, and imposed a fine of 4's. The defendant being dissatisfied with this decision, the magistrate stated a case, but limited the question to the rejection of evidence. If he was right in such rejection the conviction was to stand, if not, the case to be remitted to the magistrate to be further heard. The case was before the Queen's Bench Division a few days ago, when Mr. M'Intyre, for the appellant, contended that the magistrate ought to have had evidence of persons being substantially incommoded, because, after all, this projection might have been in a recess between two projecting houses, and so no obstruction. But the court, without calling upon the respondents, affirmed the conviction with costs, and held that the magistrate was quite right upon the facts presented to decide, and that if a hundred witnesses were called to prove that they were not obstructed, it would be no answer to the summons. This decision is identical with that in "Gabriel *v.* St. James's, Westminster," in which a projecting lamp, 10 ft. high, was the annoyance complained of.

LIABILITY OF SUB-CONTRACTOR FOR "SCAMPED" WORK.

GRIFFITHS *v.* POTTER.

IN this case, heard in the Exchequer Court, First Division (sitting at Guildhall), before Mr. Baron Bramwell and a special jury, the plaintiff was Mr. John James Griffiths, stone-merchant, mason, and pavior, of 283, Kingsland-road, and the defendant was Mr. Henry Potter, contractor, of Alfred-street, Stepney. The action arose out of the construction of the "Finsbury-avenue sewer," for the parish of St. Leonard, Shoreditch. It was stated on behalf of the plaintiff that he brought this action rather for the sake of vindicating his reputation for integrity than with the view of recovering damages.

It appeared that the plaintiff took the contract for executing the sewer and paving works in Finsbury-avenue. He sublet the sewer work to the defendant, who was to do the work, in accordance with plan and section, at the rate of 8s. per foot run, in 9-in. brickwork throughout. The defendant proceeded with the work, and on May 7, 1875, the plaintiff paid him 100*l.* on account, believing a portion of the work had been properly done. Early in June plaintiff received the defendant's account, which he sent to Mr. Perrett, the vestry surveyor, to check the "extras." On the 5th and 8th of June plaintiff wrote to the defendant to connect the drain near Queen's-square, and defendant arranged with the vestry surveyor to do it on the 10th at nine in the morning. When Mr. Perrett went to the works with his assistant, Mr. Davis, they found the connexion had been made. It was subsequently discovered that the part of the sewer into which the drain was made was only 4½-in. work instead of 9-in. work; and it was afterwards found that a large portion of the sewer was done in 4½-in. work only, instead of the 9-in. work contracted for. An investigation into the matter was made by a committee of the vestry, when the defendant for the first time stated that he had sublet the contract to a person named Munsen, who alone was to blame. The plaintiff, in order to vindicate his reputation, asked the defendant to prosecute Munsen, offering to pay a portion of the expense. Defendant declined to do this, but his solicitor proposed that he (defendant) should make a statutory declaration of the facts instead, but after various excuses the defendant formally refused to make such declaration. Plaintiff had been obliged to repave the avenue at a cost of 69*l.* 10s. In cross-examination, plaintiff said he believed the defendant knew of the fraud.

Mr. George Charles Perrett said he was surveyor to the vestry of St. Leonard, Shoreditch. Witness was invariably at the works at nine in the morning and five in the evening, and went there three times some days. He never saw any 4½ in. work exposed. When witness went to fulfil the appointment made for connecting the drain, he found that the men had worked all night, and the work was covered in. About two-thirds of the sewer was afterwards found to be only 4½-in. work, instead of 9-in.

Robert Mason deposed that he was an excavator, and was employed by the defendant upon the work for fourteen or fifteen days. Saw the work going on at night. Some of the crown of the arch was then done in 4½-in. work. The men covered it up as soon as it was done. A 9-in. end was always put right for Mr. Perrett to see in the morning.

Henry Potter, the defendant, stated that he was a contractor, and that his clerk sublet the construction of the sewer in question to Munsen. In June plaintiff told him (defendant) that the work had been "scamped."

In cross-examination defendant stated that when he last saw Munsen he said he was coming to attend this trial.

Mr. Baron Bramwell.—There must be a verdict for the plaintiff, and Mr. Benjamin (plaintiff's counsel) does not press for damages. I am sure the jury will agree with me in saying that the plaintiff at least is free from all blame in this matter.

The jury intimated their assent, and found a verdict for the plaintiff for 69*l.* 10s.

His lordship gave judgment for that amount, and certified for a special jury.

DAMAGE TO GOODS IN TRANSIT.

SINCLAIR *v.* THE GREAT NORTHERN RAILWAY COMPANY.

THIS action was tried at the Westminster County Court, recently, in which the plaintiff, a marble merchant, of Princes-street, Leicester-square, sought to recover the sum of 7*l.*, for damage done to a marble mantelpiece, in transit from Potter's Bar to London. Mr. Harmsworth appeared as standing counsel for the company.

From the plaintiff's opening it transpired that he sent a marble mantelpiece to a customer at Warren's Wood, which, not being approved of, was returned to the plaintiff.

James Maxwell, in the employ of the plaintiff, proved that the article in question was properly packed when it left the plaintiff's shop, and John Newton, from Warren Wood, proved the receipt of the packages in good condition, where they remained three weeks, and returned in the same condition to the sender, when William Bennett, the plaintiff's foreman, proved receiving the packages back, one of which was in a broken condition.

Joseph Dulley, manager to the plaintiff, said he opened the packages, and found one damaged to the amount sued for, and that he had applied to the company for compensation, who refused to make any, in consequence of which the present action was brought.

This being the plaintiff's case, Mr. Harmsworth said that the company had really no case to defend, as it had not been proved by the plaintiff where the damage had accrued, which might have occurred between Potter's Bar and Warren Wood by the carrier, who was not the agent for the company; and in reality the company were not liable.

Thomas Bonce, the checker at King's-cross, proved that when the packages reached that station from Potter's Bar they were uninjured; and Robert Hill, a porter at the same station, gave corroborative evidence, in which he was supported by that of Hold, the company's carman.

The Judge said that from the evidence of the company's witnesses there was in reality no case against them, and, therefore, he should rule in favour of the defendants; and, on the application of Mr. Harmsworth, granted the costs of counsel, attorney, and seven witnesses.

A DISPUTED CONTRACT.

ALDOUS *v.* PAYNE.

IN this case, heard in the Brompton County Court on the 24th ult., before Mr. Serjeant Wheeler, a claim was made for 21*l.*, for laying out grounds and garden.

Mr. Aldous, the plaintiff, said he was a florist and gardener at South Kensington, and last year he was engaged by the defendant to prepare plans and estimate for laying out the grounds and garden at Mornington House, North-end, Fulham. He had to obtain assistance in the matter, and the plans and specifications were submitted to the defendant and approved of, but after the work was done defendant refused to pay, on the plea that it was not done according to order.

John Higham, ornamental gardener, having given evidence in support of the plaintiff's case,

Mrs. Payne, the defendant, said she instructed the plaintiff to lay out the garden after the pattern of Mr. Scott Russell's garden, but there was nothing said about "plans," because there was no necessity to prepare any.

After some further evidence had been given,

His Honour pointed out the difference between an estimate and a contract, and ultimately gave judgment for the plaintiff for 12*l.*

ACTION BY ARCHITECTS TO RECOVER COMMISSION FROM A TRADESMAN.

WALKER AND ELSOM *v.* WEEKES.

THIS was an action before Mr. Baron Huddleston, in the Exchequer Division, to recover 160*l.*, claimed as commission upon a certain building transaction.

Mr. Day, Q.C., in opening the case, stated that the Messrs. Walker & Elsom were architects, and had been engaged by a Mr. Higgs, a person of some notoriety a few years ago, in connexion with the building of a palatial mansion and other structures in the neighbourhood of Twickenham. This Higgs was apparently but a clerk in an office in the City, but managed to amass a large amount of wealth, and to live in rather a princely style. In 1868 Mr. Higgs, being desirous of adding some horticultural attractions to his residence on the banks of the Thames, the defendants, Messrs. Weekes, who are horticultural builders in Brompton and Chelsea, were applied to for the purpose of getting certain conservatories or other structures erected. Mr. Alfred Weekes, a supposed partner of the defendant's firm, in the course of the communication which took place between Mr. Elsom, one of the plaintiffs, and himself upon the subject of the required additions, promised the plaintiffs five per cent. commission upon the transaction arising from this negotiation, and Mr. Elsom agreed to accept the same. This action was to recover 160*l.*, together with certain charges accruing on the delay that had occurred, amounted altogether to 250*l.*

Mr. Elsom, the plaintiff, in his cross-examination, stated that he was not acquainted with the defendants before the present transaction. He had been acquainted with Mr. Higgs for some years, having been engaged with his partner as architect in the building of stables. He had an agreement with him, but not in writing, by which he was to receive 5 per cent. on the cost of the structure. He would not have made a claim against the defendant unless Mr. Alfred Weekes had himself offered 5 per cent., saying it was the custom of the firm to make that allowance.

Mr. Torr.—Then, in fact, you did nothing for this sum. You accepted it as a mere gratuity?

Witness.—Yes; I submitted my drawings to the defendants. I had no authority at the time to employ the defendants specially.

Certain law points having been argued by the learned counsel on both sides, they ultimately agreed to submit the matter to the decision of the learned judge.

Mr. Baron Huddleston stated that as his opinion had been asked, and as he had an opportunity of speaking to the Lord Chief Baron (who was presiding in the next court), he had no hesitation in giving it, and that was, that there was no evidence to go to the jury in support of the plaintiffs' claim, and therefore he should order a nonsuit.

THE GREAT DOLWILYM CROMLECH.

THE letter of your correspondent, "T. N.," requires a brief answer. The illustration of this cromlech as given in the *Builder* is the first published engraving of the structure having any claim to a decided value or proper size. No claim was made in the *Builder* towards making the cromlech known to the public for the "first time." As to the trifling little woodcut in Dr. Nicholas's book, its accuracy has not been disputed, as it is evidently copied from an old and well-known photograph taken from a bad point of view. The "notice" in Dr. Nicholas's work amounts to a few lines only of perfectly valueless description. Neither cut nor description is of sufficient moment for any reference in your columns. As to the Cambrian Archæological Association having "at last found out" this cromlech, "T. N." needs to be informed that the Cambrian Association published two wood engravings, a lithograph, and an exhaustive description, together with the reproduction of some previously published notes by Sir Gardner Wilkinson on the same structure, in their *Journal* for 1872,—the year in which Dr. Nicholas's work first saw the light.

CAMBRIAN.

A NUISANCE AT FINCHLEY.

SIR,—Close to my house and garden is a parish cesspool, which was built as a temporary means of obviating the nuisance arising from the sewage of the village of Whetstone running on to the surface of a field adjoining my garden. The stench arising is at all times most offensive, and I constantly have to send my children into the house, for fear of fever.

I have complained to the Barnet Sanitary Board, and their surveyor tells me that he considers my complaint coloured, because I have not actually had a case of fever in my house during the three years I have lived here. True; but at the other end of the field there has been fever amongst the cottagers, and as the Great Northern High Barnet line runs close by the field, Goodness knows how many cases of fever are carried into London by visitors. One of the men working on the line lives in a cottage at the other end of the field, and he has only just recovered from a most serious case of fever. In addition to this, tens of thousands of school children and others will come down this line in a few weeks, and will continue to come all through the summer months, to enjoy their treats in Hadley Wood; but who can say how many of them will return to sicken and die of fever contracted from this grave public nuisance?

GEORGE VINING.

*** Write to the Central Authority, Whitehall.

THE FOOTWAY AT CHARING CROSS.

SIR,—The Metropolitan Board of Works have yielded to pressure to some extent, but abide by their determination that the footway on the frontage to Trafalgar-square need not be so wide as that along Northumberland-avenue by 3 ft., or quietly suggest that if 12 ft. is insufficient the balance can be taken out of the Strand roadway. Evidently they consider the traffic along the Strand quite unimportant, so that they may be allowed to increase the profit balance on their costly adventure. But I suppose there is no hope, and that a mistake will be perpetrated such as the Board would afterwards give their ears to undo.

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SIR,—There has of late been much talk, as you say, about the endowment of research. This title may be a step towards a correct notion which has not yet attained its ultimate form. It is only partially developed, and if it were acted upon as now expressed, would lead to a considerable expenditure of money, without producing any adequate results. What we should really advocate is the endowment of men. This has been the policy which has led to the most splendid results in wisely-governed states, and in all ages. We rely too much on the machinery of institutions to accomplish our ends. This leads to a vast amount of patronage, under which nations generally become consumptive and break down. Institutions may do very well in the jog-trot of peace and easy circumstances, but when the pinch and strain come these give way. The clamour is then for men, and if a country has not taken care of them, she will either be in sore distress, or absolutely ruined. This is England's weak point. Dilettanti foppery flourishes to the exclusion of thoroughness, both in science and art. It may be urged that the true genius will work on under the most dire disadvantages, and without the slightest recognition from the charmed domain of showy seeming. This is quite true, but how much does a nation lose by the impediments cast in the way of a great man's life? Who shall answer that? To endow research, however, would be but to induce a lot of pigmy minds to pose themselves in the attitudes of giants, and to exclaim, "We will be discoverers!" The nation would, in that case, doubtless have most wonderful discoveries made. Germany is wiser in its generation, and when she finds a great man takes care of him. It is a sign of mental health in a State when it knows a great man, and not only recognises, but takes care of him. We stone genius to death with difficulties. The kind of men we require is not to be made by the endowment of research. I think it was Mrs. Glasse who said, first catch your hare and then cook him. In a somewhat similar vein I would say to those who are advocating the endowment of research,—first catch your genius, but in this case do not *do for* and cook, but endow him.

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STAINED GLASS.

Gloucester.—The great window of the north transept of the Cathedral has been filled with painted glass, as a memorial of Sir Michael Hicks Hicks-Beach, bart., M.P., and Lady Caroline Susan Beach. The window is by Messrs. Hardman, of Birmingham, and subjects are connected with the life of St. Paul. In the two sets of eight lights under the transom are represented St. Paul restored to sight, introduced to the apostles, Elymas the sorcerer, the offer of the priest of Jupiter to sacrifice to Paul and Barnabas, Council at Jerusalem, Paul casting out a spirit of divination, restoring Eutychus to life, and before Felix; Paul let down in a basket, making tents, beaten with rods, stoned, dragged out as dead, delivered from prison, shipwrecked, shaking off the viper. Four subjects occupy the eight lights over the transom,—stoning of Stephen, conversion of St. Paul, the third Heaven, the Martyrdom. In the centre, over these, our Lord is represented; on either side and beneath are cherubim, and in two uppermost lights are cherubim with crown and palm. At the base are the armorial bearings, and an inscription.

St. Giles's Cathedral (Edinburgh).—Another stained-glass window has been placed in the south aisle of St. Giles's Cathedral, and, in accordance with the plan laid down by the Restoration Committee, the subjects illustrated are the parables of "The Talents" and "The Ten Virgins." The inscription underneath the window reads,—"In memory of Alexander Clapperton, merchant, Edinburgh, born 1782, died 1849; and Ann Hume, his wife, born 1792, died 1873. Erected by their sons, John and Alexander Clapperton, 1876." The designs, and the execution of the work, are by Messrs. Ballantyne & Son, carried out under the direction of Mr. Robert Herdman, R.S.A.

Coatbridge.—The parish church of Coatbridge has just received an addition by the erection in the south gallery of two painted windows, presented by Mr. A. Whitelaw, M.P., and Mr. Wm. Weir, of Kildonan. The treatment adopted corresponds to that of the other windows in the church, having a single figure occupying the main position in each light, with a picture underneath, illustrative of a scene in the life of the apostle depicted. The figures are those of James, Paul, Peter, and Jude; and the pictures represent the martyrdom of James, the preaching of Paul at Athens, the calling of Peter, and the miraculous draught of fishes. The tracery lights above the main windows represent two angels, carrying between them a scroll inscribed with a text. The window is by Messrs. Morris & Co.

Northampton.—The east window of St. Giles's Church, Northampton, has recently been filled with stained glass at the expense of Mr. T. Portal, of Springfield, to the memory of his father, mother, wife, and two children. The subject of the window is the "Te Deum," and the work has been carried out by Messrs. Clayton & Bell. The window consists of five lights, the centre light containing a representation of the Saviour in majesty, surmounting a representation of the Holy Innocents. The two adjoining lights contain figures of angels glorifying the central figure of our Lord, and surmounting figures of Daniel and St. Catherine, whilst the tops of the lights contain respectively figures of David and St. Cecilia. The right-hand light contains at the top figures of St. Barbara and St. Mary Magdalene; in the centre, figures of St. Agnes and St. Lucy; and at the base, figures of St. Hilda and St. Susana. The left-hand light contains, in corresponding positions, figures of St. Peter and St. John; St. Giles and St. Edward the Confessor; Moses and Joshua.

Evesbatch.—Two stained-glass windows have been completed at the recently-restored church of Evesbatch, near Malvern, by Messrs. Wailes & Co., of Newcastle-upon-Tyne, one at the west end representing St. Andrew, after whom the church is named, the other on the south side of the chancel representing the Nativity of our Lord. The latter was the gift of the Misses Perrins, of Malvern.

West Derby.—The five-light east window of the new Thornton chancel at St. James's Church, West Derby, has been filled with stained glass by Messrs. Wailes, of Newcastle. It contains medallions with subjects of our Lord's Passion. The Crucifixion occupies the central place, with the Ascension above it, the triumphal entry and agony on one side, and the entombment and resurrection on the other, the institution of the

Lord's Supper below it, with the typical subjects of Abel and Melchisedek on one side, and the sacrifice of Isaac and the Passover on the other, the two sexfoils above being filled with the "Ecce Homo" and the "Agnus Dei."

Davidstow (Cornwall).—The old church of Davidstow, in Cornwall, has recently been rebuilt by the munificence of Miss Pearse, of Launceston. Three stained-glass windows have just been erected in the new building, by the firm of O'Connor & Taylor.

Whitford (Flintshire).—A stained glass five-light east window, by Mr. C. A. Gibbs, of the Marylebone-road, in memory of the late Mr. Alexander Cope, J.P., of Saithaclwyd, New Halkyn; also marble chancel-steps and altar railing, and an encaustic-tile floor, have been executed here, Mr. Lingen-Barker being the architect, and Mr. W. Balcombe the contractor.

CHURCH-BUILDING NEWS.

Evesbatch.—The parish church of Evesbatch, lying about midway between Malvern and Bromyard, was reopened on the 16th ult., after restoration under the direction of Mr. T. Nicholson, architect, Hereford. The church, which is very small, being scarcely capable of holding 100 persons, was, prior to the restoration, greatly dilapidated. The original walls of rude stones, both inside and out, were covered with common plaster and whitewash, except where time and negligence had let it fall off. These, where not taken down and rebuilt, have been scraped on the outer face and pointed. New buttresses have been added; the quoins to the angles are new, as also are the windows. A new south porch and a vestry-room on the north side have been added. A new wall at the west end under the tower has been put in; the upper part of tower, from the eaves, is new. The new porch is also of old oak, varnished. The whole of the roofs are new throughout. The chancel and nave floors are laid with encaustic tiles. The contractors were Messrs. Barratt, of Castle Frome, and the entire cost has been about 750*l.*

Sheffield. — The corner-stone of the Sale Memorial Church, Dyer's-hill, Sheffield, was laid on the 16th ult. by Mrs. Moorhouse, wife of the Bishop-designate of Melbourne, and daughter of the late Rev. Canon Sale, D.D. The church is the outcome of a desire to perpetuate the memory of the late Rev. Canon Sale, and will stand on the site of the Old Ropery, in South-street, Park, having a side elevation to the street. The plan comprises nave, aisles, a chancel with an octagonal end; two chancel transepts or side chapels, one to be used for the children and the other for the vestry and organ; and a roomy porch at the level of South-street. The extreme internal length of the edifice will be 109 ft., and the width 65 ft., the height of the nave at the centre being 51 ft. The building externally will be simple in character, the style being Early Pointed, changing into that of a little later period, with geometrical tracery in the chancel. A bell turret of massive proportions, rising 130 ft. above the ground at one angle of the nave, forms an important feature of the design. The expenditure, without the turret, is estimated at 8,700*l.*

Edinburgh. — The foundation-stone of a new Episcopal Church was recently laid at Boroughmuirhead, Morningside, Edinburgh. It is to be seated for upwards of 500 persons, and will cost between 10,000*l.* and 11,000*l.* Miss Falconer, of Falcon Hall, is to defray the expense of the chancel, which will amount to upwards of 3,000*l.*

Hampton-in-Arden.—An effort is now being made for the restoration of the parish church of Hampton-in-Arden. The state of the fabric has for many years been a cause of grave anxiety, and the dilapidations are now so serious that a complete restoration is necessary. Even so far back as the year 1656, Sir William Dugdale, in his account of Hampton-in-Arden, says that "this church, being situated on so far an ascent, had a tall spire, which was a noted mark to a great part of the woodland, till by the extraordinary violence of lightning and thunder, happening on St. Andrew's Day, at night, in the year 1643, it was cloven, and fell to the ground; at which time the whole fabric, with the tower, were torn in divers places." From that time to the present the Forest of Arden has been without its well-known landmark; the fabric is still "torn in divers places," and some unsightly additions, worse almost than dilapidations, have been allowed to disfigure the architectural beauty of the church. Plans (approved by the bishop and archdeacon) have been prepared by Mr. W. E. Nesfield, architect, for the restoration of the building; but the cost so far exceeds the resources of the locality that the building committee are compelled to appeal for aid outside the parish, and the Rev. T. J. Morris (the vicar) accordingly asks for contributions.

Oxford.—The petition to the Bishop of Oxford for a faculty for the restoration of St. Mary's Church has been published. It states that it is now judged expedient, not only from considerations of architectural beauty and ecclesiastical propriety, but also in order to promote the general convenience of those that frequent the services of the church, altogether to remove the galleries which at present occupy the entire northern and western sides of St. Mary's Church; but, in order that no loss of accommodation may result from this change, to remove the partition wall (erected in the year 1733), between Adam de Brome's chapel and the body of the church; and also to remove the present cumbrous stone screen and organ-loft, which slightly encroaches upon the nave, as well as to readjust the sittings throughout the church, whereby an increased number of sittings of the parishioners at their parochial services, and for the members of the University at the University services and sermons, will be obtained, and the general comfort of both congregations be largely promoted. It is proposed to entrust the work to Sir Gilbert Scott. The estimated cost is between 18,000*l.* and 20,000*l.*, about one-half of which sum will be expended in remodelling the church, and the remainder for the decorations for the interior. In addition to 1,000*l.* given by the University, Oriel College, in whose gift is the living of St. Mary's, has voted 300*l.*

Bishopstrow.—About 1,200*l.* are about to be spent on the parish church of Bishopstrow, Wilts. It is proposed to repair the stonework of the nave and tower, and open out the south windows in the tower; to remove the existing ceiling of the nave, and open out and repair the oak roof; to take down the north porch leading into the chancel, to remove the ceiling, and take off the roof of the latter, and to lower the height of the walls thereof, and to insert new windows into them; rebuilding the arch between the chancel and nave, and re-roofing the chancel. A new vestry-room is also to be built on the site of the present porch, together with an organ-chamber opening into the chancel. The existing organ gallery is to be taken down and removed.

Wilby.—Wilby Church, near Stradbroke, was reopened on the 27th ult., after restoration. The church belongs to the Perpendicular period, there being no evidence of any building of earlier date. Its most prominent feature is one of those fine flint towers of which there are so many in Suffolk. This tower was in a very good state, and all that the architect in whose hands the restoration was placed—Mr. R. M. Phipson—found it necessary to do to it was to have new slate louvres placed in the belfry windows, to have the stone quoins renewed here and there, and the flint work picked out afresh in places. Whilst the tower needed comparatively little attention, the rest of the church, that is to say the nave, south aisle, south porch, and chancel, both inside and out, was greatly in need of restoration, for the walls were all plastered over, the windows of the aisle in a dilapidated condition, the lead roof of the chancel needed renewal, the stone dressings of the buttresses, &c., in many places were in a bad state, the stonework of the remarkably rich porch had suffered much, and a large part of the nave and the chancel were filled with high pews. Not much has been done to the open timber roof of the nave besides restoring the carved bosses at the intersections of the beams. The floor of the chancel has been re-laid with Minton's encaustic tiles, and a warming apparatus has been supplied by Messrs. Gidney, of East Dereham. As already noticed, the restoration has been carried out under the supervision of Mr. R M. Phipson. Mr. Grimwood, Weybread, was the contractor; Mr. Vine, Eye, executing the stone work; and Mr. Bullen, Stradbroke, the bricklayer's work, whilst the wood-carving is the work of Mr. Groom, Ipswich. The total cost has been nearly 1,000*l.*

Kingstanley.—The parish church of St. George, Kingstanley, Gloucestershire, was reopened on the 20th ult., after restoration under the direction of Mr. Bodley, architect, London. The church, which dates from Norman times, exhibited, until lately, some of the worst features of that neglect and patching-up which characterised the "churchwarden" period. It appears that the rector has been labouring for fourteen or fifteen years to bring the work of restoration about; and about two years ago Mr. S. S. Marling, one of the present members for the borough of Stroud, made an offer to enter into an agreement with the rector to undertake the whole of the work necessary for the restoration of the nave, the whole of the aisle, and the tower; whilst his son, Mr. William Marling, undertook the repair of the porch and the external work in the churchyard, on condition that the rector, with the assistance of his friends, made himself responsible for the building of a new chancel arch, the new building of the chancel, with vestry and organ chamber, and for a new organ, and the whole of the furniture of the chancel. The whole work will cost between 3,000*l.* and 4,000*l.*

Books Received.

The Fall of the Stuarts, and Western Europe from 1678 *to* 1697. By the Rev. E. HALE, M.A., Assistant Master at Eton. London: Longmans, Green, & Co. 1876.

THIS is one of a valuable series of historical handbooks now in course of publication under the title of "Epochs of Modern History," and which narrate the history of England and Europe at successive periods subsequent to the Christian era. It is edited by good hands, and had its origin in the conviction that, "for purposes of education or study, a complete picture of any one important period of the world's history, carefully prepared and in an inexpensive form, is of more value than a mere outline of a history of a nation." Educationally these books are, we believe, successful. They are much used in middle-class schools, and will, we trust, lead to a more scientific and rational study of some few years of the world's history, rather than a barren outline of dates and births, conveying no idea of men or people to a pupil's mind. The Rev. Edward Hale, an accomplished scholar, has evidently devoted much time and consideration to the volume before us, small as it is, and has been successful in placing before young readers the result of a large amount of reading in an easy and simple form.

VARIORUM.

CASSELL'S FAMILY MAGAZINE well maintains its position, and at 7d. is certainly one of the cheapest of its class.——Sir Edmund Beckett, bart., author of "Clocks, Watches, and Bells"; "Lectures on Church Building"; "Astronomy without Mathematics," &c., has in preparation a new work to be entitled "A Book on Building." The subject will be treated both in its legal and practical aspects.——In the *Leisure Hour* a series of brief papers is appearing, giving seasonable information as to the history and present condition of Bosnia, Servia, and the other border lands of Turkey in Europe. Concerning Montenegro, the writer says:—"The capital, Cettigne,—certainly the humblest one in Europe,—consists of one long street of stone houses of two stories; from the middle of which another wider street projects at right angles, leading up to the palace. A large inn stands at the end of the main street for the use of visitors, and also for the accommodation of the senators who come from a distance. In itself nothing can be less romantic than the capital of the Black mountain. The senate is composed of sixteen elected chiefs of tribes, subject, however, to confirmation by the Prince; it is both a deliberative and judicial body. The Prince is the centre of authority, and to him personally every peasant has the right to appeal on every matter, however trivial. The usual meeting-place of the senate in summer is a green or meadow in front of the palace, under the shade of a wide-spreading tree, round which two rows of seats are built. There is a seat for the Prince, and below him the senators are ranged. Visitors to Cettigne may daily see the senate administering justice in the open air. There is, therefore, some ground for the boast that the Montenegrin senate-house is the largest in the world.

Architects Abroad.—The King of Holland has created Mr. Cuypers, the well-known architect of Amsterdam, a "Chevalier de la Couronne de Chêne." Architects receive more attention from the reigning powers on the Continent than they do here.

Miscellanea.

Art at the Royal Aquarium, Westminster.—The society's gold medal and 100*l.* for the best oil painting has been awarded to Mr. C. Green for his picture, "May it Please Your Majesty." The society's gold medal and 100*l.* for the best water-colour drawing has been awarded to Mr. J. D. Watson for his drawing, "Stolen Marriage." The society's gold medal and 100*l.* for the best piece of sculpture has been awarded to Mr. J. E. Boehm, for his group, "Short-horned Bull." The society's silver medals have been awarded to Mr. H. Moore, for his painting, "Sunset after Wind and Rain"; to Mr. A. Stocks, for his painting, "The Old Sailor's Museum"; to Mr. A. Johnstone for his painting, "The Flight of Mary of Modena"; to Mr. W. Hall for his water-colour drawing, "River Hodder"; and to Mr. G. Simmonds, for his statue of the "Falconer." The society's bronze medals have been awarded to Mr. A. F. Grace, for his painting, "The Moon is up, and yet it is not Night"; to Mr. A. de Breanski, for his painting, "September,—St. Paul's Cray Common"; to A. Hopkins, for his water-colour drawing, "The Mowers"; to E. H. Corbould, for his water-colour drawing, "Entry of Henry V. into London, after the Battle of Agincourt, November 23, 1415"; and to A. Bruce Joy, for his group, "The Fairy Tale."

The Architect's Department of the London School Board.—At the last meeting of the London School Board, the Works Committee submitted a recommendation to raise the salary of one of the clerks in the architect's office from 130*l.* to 150*l.* a year. Mr. Morgan, one of the members of the Board, opposed the recommendation, contending that the per-centage of the proposed advance in proportion to the salary was too high, especially as the clerk referred to had had two advances, amounting to 30*l.*, within two years, and now a third was proposed, making 50*l.* within two years. Mr. Morgan also raised a question as to the salaries and staff of the architect's department, but after explanations had been given by the chairman that the staff of the architect was not guided in the matter of pay by the rules laid down for other departments, inasmuch as it was a shifting staff, and was, in point of fact, being much reduced, and would possibly hereafter be almost abolished, Mr. Morgan withdrew his opposition.

Artists' Benevolent Fund.—The dinner in aid of this fund is fixed for the 17th inst., when Sir William Fraser, M.P., will preside, and should be well supported. The "Artists' Fund" was established in the year 1810, and consists of two distinct branches, "The Artists' Annuity Fund," raised and supported by the contributions of its members for their own relief in sickness or old age, and "The Artists' Benevolent Fund." The Artists' Benevolent Fund, which is a strictly charitable society, has for its object the relief of such of the widows and orphans of members of the Artists' Annuity Fund as are left in need; and this looks for support from the patrons of the fine arts and artists, and the annual contributions of the members of the Annuity Fund. The annual sum of 20*l.* is paid to each widow, and the annual sum of 5*l.* is allowed for each orphan under the age of sixteen.

The National Portrait Gallery.—The nineteenth annual report of the trustees of the National Portrait Gallery has been published. The trustees comment on the grievous loss sustained in the death of Earl Stanhope, their late chairman, who took a deep interest in the progress of the National Portrait Gallery. Five donations of paintings have been received by the trustees during the past year,—portraits of the Duke of Wellington, the Marquis of Rockingham, Mr. Charles Babbage, the Countess of Cumberland, and Mr. Charles Moorland. The trustees have purchased fifteen new portraits during the same period, and these are now placed in the gallery. There has been a steady and large increase in the number of visitors to the gallery.

Another Fire at Canterbury Cathedral. On the afternoon of the 2nd inst. a fire broke out in the Clock-tower of Canterbury Cathedral. It seems that the fire was occasioned by an explosion of the vapour of some benzoline used in cleaning the clock, and which had accumulated in the clock-case. Mr. Trimnell, a local tradesman, at the time was holding a lamp to enable one of his workmen to see the machinery, and was seriously injured in the face and hands by the explosion.

The Sunday Society.—The object of this Society is to obtain the opening of museums, art galleries, libraries, aquariums, and gardens on Sundays. It appeals to all who, having at heart the improvement of the people, desire to see vexatious restrictions on the use of an inestimable privilege superseded by legislative enactments which shall represent the freedom and enlightenment of the age. It desires to secure the co-operation of every one who recognises the elevating influence of science, literature, and art, and wishes for the addition of an intellectual observance of Sunday to that which has hitherto exclusively obtained amongst us. The committee meet at 1, Adam-street, Adelphi, and Mr. Mark H. Judge is the honorary secretary.

Steam on Tramways.—During the whole of last week a new tramway engine, manufactured by Messrs. Merryweather & Sons, London, whose name is intimately known in connexion with steam fire engines, was running on the Dewsbury, Birstal, and Batley tramway line in Yorkshire. The engine was attached to an ordinary car, and worked the regular traffic in its turn with the horse cars. It is entirely enclosed, and presents the appearance of a diminutive car in front of the other car, and is free from noise, smoke, &c. It is now the intention of the above tramway company to apply for Parliamentary powers to work steam on their lines. We understand that similar engines by these makers have for some time been running on the Paris tramway lines.

The "Universal" Disinfecting Powder. The time is coming when all will find good occasion for a safe and cheap disinfectant, and here, if we are not misinformed, is one. It is described as a combination of the mineral sulphates with the chlorides of the earthy salts. In solution, a chemical change occurs, making the solution slightly acid, and setting free a portion of chlorine and forming a proportion of chlo. zinc; thus this disinfectant acquires in use a combination of valuable antiseptic powers. It is said to be fully one-third cheaper than carbolic acid. We have tried it with satisfactory results, but depend rather on the professional testimony given in its favour.

Site for Government Offices, Westminster.—In the House of Commons, on the 29th ult., Mr. James asked the First Commissioner of Works if it was the intention of the Government, in accordance with the intimation given at the commencement of the session, to introduce a Bill for the purpose of appropriating as a site for public offices the land and buildings within Great George-street, King-street, Charles-street, Westminster, and St. James's Park. Lord H. Lennox said the Government had abandoned their intention to introduce a Bill with reference to this site.

Warwick Borough Surveyor. — Mr. Pritchard, C.E., has relinquished his duties as surveyor to the borough of Warwick, in consequence of his engagements as a consulting engineer on water-supply. He will continue to act on behalf of the borough in the latter capacity until the completion of the Haseley water scheme. His successor as the town surveyor is Mr. George Lewis, of London. The other four selected candidates were,—E. Frost, Hanley; R. Richardson, Cleator Moor; R. H. Inch, Croydon; and J. Eayres, Llanelly.

The Botanic Gardens.—On the 1st inst. the Duke of Teck, president of the Royal Botanic Society, who was accompanied by the Duchess and their children, opened the new wing of the Conservatory of the Royal Botanic Society of London, in Regent's Park. The winter-garden is thus completed, at a total cost of about 8,000*l.* The portion just finished has cost 1,600*l.*, which was raised by special subscription among the Fellows; and it makes the total superficial area of the winter-garden now 23,500 ft.

Temperance Hospital.—A bazaar is being held in Exeter Hall. Its object is to help to raise the sum of 10,000*l.* still required to erect the new Temperance Hospital Buildings, a suitable site for which has been acquired in the Hampstead-road. Upwards of 10,000*l.* have been already subscribed.

The Sand-Blast.—The sand-blast works at West Rutland, N.Y., have been engaged for the last year and a half in the manufacture of head-stones for the national cemeteries. The names are inscribed upon the stone by the sand-blast in fifteen minutes.

Value of City Property.—The freehold site of the Church of St. Antholin, Queen Victoria-street, having frontages to Queen Victoria-street, Budge-row, and Sise-lane, and occupying a ground area of 4,330 square feet, was sold, last week, by auction, at the Mart, Tokenhouse-yard, by Messrs. Fuller, Horsey, Son, & Co., for 46,350*l.*, or at the rate of 10*l.* 15*s.* per square foot.

Rinks.—A new rink in Coventry-street, Haymarket, called the "Empress," has been opened. Claridge's Asphalte Company have laid the floor.——The Belsize Skating Rink has been re-opened. Since it has been closed, the old floor has been taken up, and Seyssel asphalte substituted, which has been provided and laid by the Société Française des Asphaltes (Limited).

Reredos, St. John's, Winchester.—A new reredos has just been erected in the church of St. John, Winchester. It is Perpendicular in style, and divided into five recesses, surmounted by enriched canopies, under which stand the four Evangelists, sculptured in Caen stone, the centre panel representing our Lord as the Good Shepherd. It was executed by Mr. Hitch, from the design of Mr. Clarke, architect.

The Slade Professorship, University College.—We believe this is still open. Mr. W. Cave Thomas, who is a candidate, has submitted a very remarkable set of testimonials. There are six candidates. One of them, we are told, cannot speak English, and has probably, therefore, a good chance in these times when we are made to take our Shakspeare through foreign lips.

The Artisans' Dwellings Act in Dublin. In Dublin a company has been formed for the purpose of carrying out the provisions of the Artisans' Dwellings Act in that city. Justice Fitzgerald presided. There is to be a capital of 50,000*l.*, 13,000*l.* of which have been already subscribed.

TENDERS

Accepted for two detached residences at Alverthorpe, for Mrs. Adams. Mr. William Watson, architect:—

Excavating, Brick and Stone Work.
Fawcett £1,039 5 0

Slating.
Pycock & Sons 93 15 0

Plastering.
Platts 106 0 0

Carpenter and Joiner.
Phillips 407 0 0

Plumbing, Glazing, and Ironwork.
Kirk 167 0 0

Painting.
Leak 22 0 0

For Board schools and residence at Normanton Common, for the Normanton School Board. Mr. William Watson, architect:—
Young (accepted) £3,000 0 0

For rebuilding business premises in Baxtergate, Doncaster, for Mr. S. Anderson. Mr. William Watson, architect:—
Anelay (accepted) £647 0 0

Accepted for a block of three houses on the St. John's Estate, Wakefield, for Mr. John Link. Mr. William Watson, architect:—

Excavating, Brick and Stone Work.
Dickenson £1,065 0 0

Slating.
Pycock & Son 66 10 0

Plastering.
Platts 119 10 0

Carpenter and Joiner's Work.
Speight 497 0 0

Plumbing, Glazing, and Ironwork.
Brooke 199 0 0

Painting.
Naylor 24 0 0

For making alterations at the Angel Tavern, John-street, Minories, for Mr. H. Chown. Mr. John Viney, architect:—
Cole £559 0 0
Shurmur 495 0 0
Grimwood 455 0 0
Downs (too late) 447 0 0
Lamble 430 0 0
Eaton 392 0 0
Andrews (accepted) 300 0 0

For alterations at the Devonshire Arms, Lancaster-street, Lancaster-gate, for Mr. F. Gwyer. Mr. John Viney, architect:—
Eaton £285 0 0
Coates 208 0 0
Godden 255 0 0

For rebuilding warehouse, No. 103, Hatton-garden, for Messrs. Hodge & Co. Mr. Lewis H. Isaacs, architect. Quantities by Mr. L. C. Riddett:—
Gammon £3,665 0 0
Wagstaff 3,630 0 0
Howard 3,544 0 0
Scrivener & White 3,499 0 0
Wagner 3,357 0 0
Killby 3,356 0 0
Macey 3,293 0 0
Brass 3,197 0 0

For the erection of a new horse repository, Canterbury, for Mr. George Slater. Mr. John Green Hall, architect:—

Gaskin	£2,820	0	0
Naylar	2,790	0	0
Wiltshire	2,767	0	0
Cosens	2,703	0	0
Wilson	2,682	0	0
Paramor & Son	2,660	0	0
W. & T. Denne	2,476	0	0
Featherstone & Lucas (accepted)	2,447	0	0

For new out-patients' department for Royal Hospital for Diseases of the Chest (exclusive of foundations), City-road. Mr. J. O. Abbott, architect. Quantities by Mr. G. Jackson:—

Colls & Sons	£2,458	0	0
Allen & Son	2,431	0	0
Manley & Rogers	2,414	0	0
Ranor	2,370	0	0
Dove, Brothers	2,365	0	0
Downs & Co.	2,102	0	0
Brass	2,063	0	0

For the erection of a villa at Ealing, for Mr. J. Davies. Quantities by Messrs. Northcroft, Son, & Neighbour:—

Nodes	£3,322	0	0
Sheppard	2,925	0	0
Mason	2,897	0	0
Adamson	2,814	0	0
Hook & Oldrey	2,799	0	0
Nye	2,725	0	0
Walters	2,663	0	0

For ten cottages at Hammersmith. Mr. R. E. Tyler, architect. Quantities by Mr. T. Nixon:—

Downs	£4,100	0	0
Lynn	3,990	0	0
Wall, Brothers	3,974	0	0
Smale	3,684	0	0
Marsland*	3,287	0	0

* Accepted for reduced amount, 2,986*l*.

For a block of warehouses, Paternoster-square. Mr. R. E. Tyler, architect. Quantities by Mr. T. Nixon:—

Phillips (accepted)	£5,847	0	0

For painting and decorative work at the Butchers' Hall, Eastcheap. Mr. H. Winstanley, architect:—

Pitman & Cuthbertson	£278	0	0
Colls & Son	259	0	0
Phillips & Son	237	0	0

For erecting twenty houses at Stratford, for Dr. Sweetman. Mr. E. Hide, architect:—

Page	£6,660	0	0
Lewis	5,900	0	0
Judd & Hawkings	5,080	0	0
Ladd	4,200	0	0

For the erection of a villa residence at West Barnes, Merton, Surrey, for Mr. C. Dickson. Mr. Marsh, architect:—

				If old house is pulled down and old materials re-used.		
Boyd	£1,598	0	0	£1,623	0	0
Judd & Hawkings	1,382	0	0	—		
Scase	1,143	0	0	1,160	10	0
Jarvis	—			995	0	0
Cobb	850	0	0	890	0	0

For the erection of a villa at Sheridan-road, Merton, for Mr. F. G. Courthope. Mr. Marsh, architect:—

Judd & Hawkings	£1,859	0	0
Boyd	1,848	0	0
Scase	1,550	0	0
Cobb	1,375	0	0

For house and school at Bickley. Messrs. Cooper & Son, architects:—

Boyd	£5,649	0	0
Payne & Bulling	4,060	0	0
Taylor & Son	3,900	0	0
Copping	3,827	0	0
Jopling & Co.	3,728	0	0
Staines & Son	3,686	0	0
Judd & Hawkings	3,627	0	0
Prebble & Co.	3,580	0	0

For the erection of buildings, 355, Hackney-road. Mr. Charles Fowler, architect. Quantities by Mr. Henry Lovegrove:—

Lawrence	£1,368	0	0
Chessum	1,338	0	0
Bays, Brothers, & Allen	1,297	10	0
Allen & Son	1,240	0	0
Brown & Sons	1,200	0	0
Smith	1,177	0	0
Bangs & Co.	1,159	0	0

For new schools and residence at Brockley, Suffolk. Mr. F. Whitmore, architect:—

Hawkins (accepted)	£640	0	0

For alterations and additions to house at Steeple Bumpstead. Mr. F. Whitmore, architect:—

Mason & Son (accepted)	£449	0	0

For rebuilding farm premises at Runwell, for Mr. Thos. Kemble. Mr. Frank Whitmore, architect:—

Kennell (accepted)	£521	0	0

Accepted for new church at Hawsker, near Whitby:—

Masons' Work.

Winterburn	£938	9	3

Joiners' Work and Slating.

Robinson	490	0	0

Plumbing.

Brown	87	10	0

Painters' Work.

Readman	27	0	0

For offices, Fenchurch-buildings, including extra prices. Mr. Robert J. Worley, architect:—

W. & F. Croaker	£1,675	0	0
Falkner	1,235	0	0
Timewell	1,085	0	0
Rudkin (accepted)	1,057	10	0

For the erection of a new Roman Catholic church, presbytery, and schools, Market Harborough. Mr. C. G. Wray, architect. Quantities by Messrs. Linsdell & Giffard:—

Parnell & Son	£5,761	0	0
Bayes, Brothers, & Allen	5,497	0	0
Stamp & Bowtle	5,358	0	0
Jennings	5,345	0	0
S. & W. Pattinson	5,000	0	0
Halliday & Cave (accepted)	4,900	0	0
Margetts	4,658	0	0
Conquest	4,551	0	0
Bassett	4,438	0	0

For house and stabling, Hampstead Hill-gardens, Hampstead, for Dr. Andrew Miller. Messrs. Batterbury & Huxley, architects. Quantities supplied:—

Contract No. 1 (foundations).

King (accepted)	£130	11	9

Contract No. 2 (house, stables, and fence walls).

Deards	£3,835	0	0
Nightingale	3,260	0	0
Manley & Rogers	3,133	0	0
Patman & Fotheringham	3,095	0	0
Burford	2,996	0	0
King (accepted)	2,880	0	0

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Erratum.—In "Notes from Manchester" in last number, for "Union Land and Building Company," read "The Queen's Building Society."

Hastings Town Hall.—We have already mentioned that the premium was awarded to two firms in combination. The drawings from which our illustrations were made were signed by only one of them, and their names we therefore appended to the view.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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